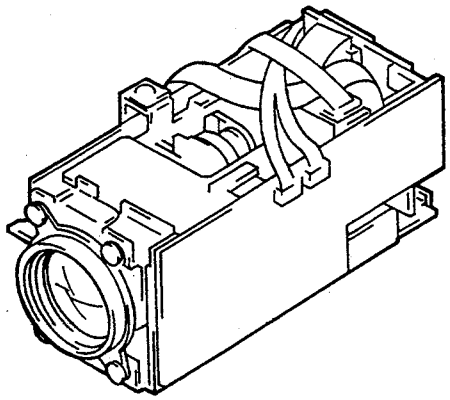
EVI-330V
EVI-331V

SERVICE MANUAL

EVI-330V (NTSC)
EVI-331V (PAL)



COLOR CAMARA BLOCK

SONY®

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1. GENERAL

1 Outline

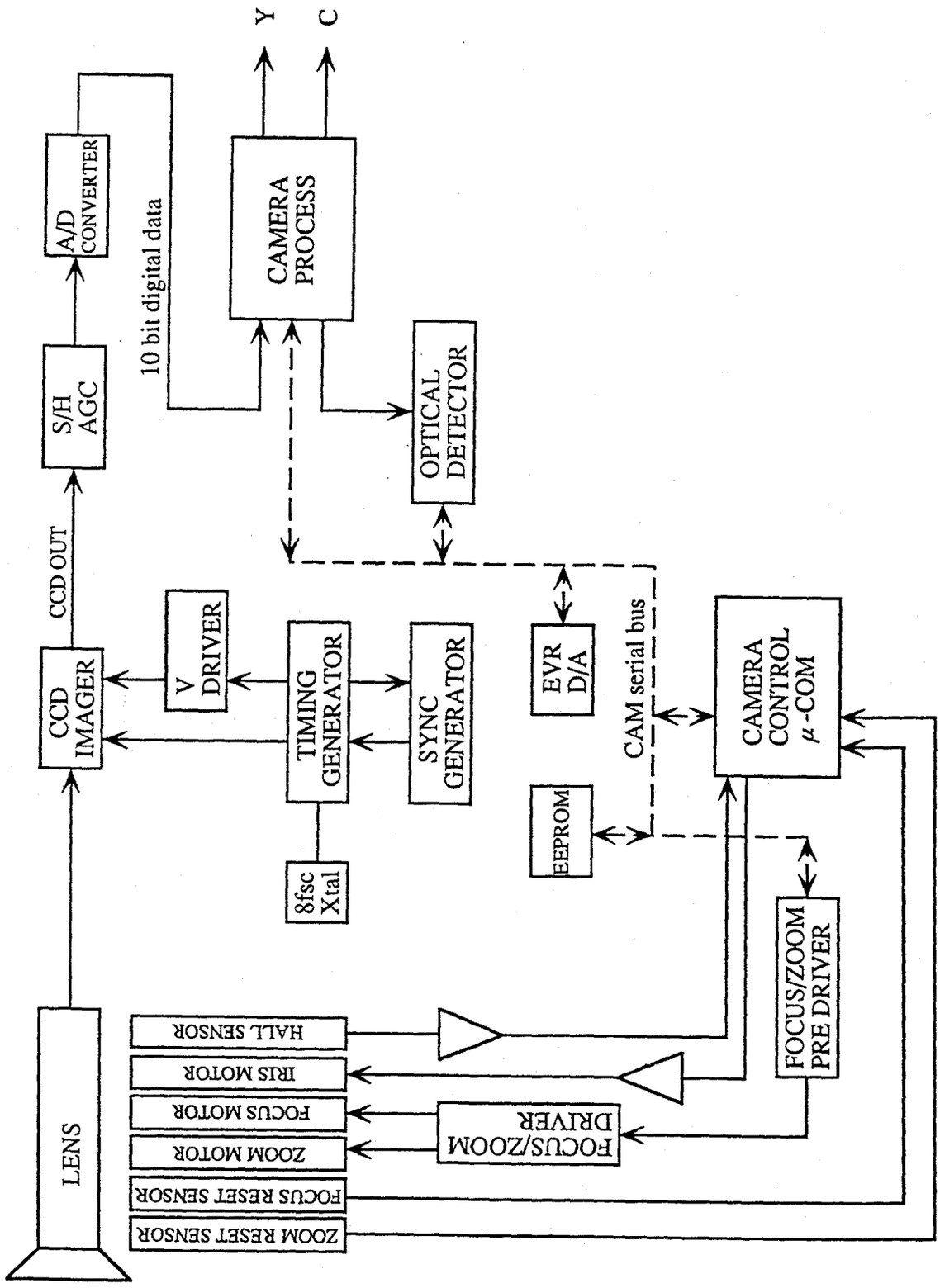
The EVI-330V (NTSC)/EVI-331V (PAL) is an ultra-compact CCD camera block with 12 times zoom, auto-focus lens. Adopting the 1/3 inch 380000/440000 effective pixels CCD, high resolution of 460 lines has been realized.
Its functions such as zoom control, focus control, selection between automatic-compensation white balance (AWB), one-push white balance, and preset white balance, electronic shutter speed up to 1/10000 seconds, 24-level bright control (brightness control function), backlight compensation function allow brightness to be adjusted extensively. Its position preset function allows its camera functions to be preset in six different ways.
The EVI-330V/331V uses the DSP which enables camera functions to be controlled digitally.
The video outputs consist of the composite output and YC output.
The input power supply is 6V to 12V.

SPECIFICATION

	EVI-330V (NTSC)	EVI-331V (PAL)
Image Sensor	1/3" IT CCD	
Pixels / Effective Pixels	410 K / 380 K pixels	470 K/ 440 K pixels
Picture Elements	768(H)×494(V)	752(H)×582(V)
H. Resolution (Center)	more than 460 TV lines	more than 450 TV lines
V. Resolution (Center)	more than 350 TV lines	more than 400TV lines
Lens	12 × Zoom f=5.4 to 64.8mm F1.8 ~ 2.7 Wide Macro, Auto Fucus(Inner Focus System)	
Angle of View (H) (V)	approx 48.8 degrees (wide end) to 4.4 degrees (tele end) approx 37.6 degrees (wide end) to 3.3 degrees (tele end)	
Lens constructure	9 elements in 6 groups (including 2 aspherical lenses)	
Shortest Subject Dist.	10mm (wide end) : 800mm (tele end)	
Video Out (75Ω Terminated)	Y : VS1.0Vp-p sync negative C : Burst 0.286Vp-p VBS : 1.0Vp-p composite	Y : VS1.0Vp-p sync negative C : Burst 0.300Vp-p VBS : 1.0Vp-p composite
Min. Illumination	7 Lux F1.8 (more than 50 IRE)	
S/N Ratio	more than 48dB	
White Balance	TTL Auto tracing, One push Hold, Indoor Preset, Outdoor Preset	
Electronic Shutter	27 step (1/60 sec. up to 1/10000 sec.)	28 step (1/50 sec. up to 1/10000 sec.)
Flickerless	Auto	
Operating Temperature	0°C to 50°C	
Storage Temperature	-20°C to 60°C	
Operating Humidity	30% to 85%	
Storage Humidity	20% to 90%	
Power Requirements	DC 6 to 12V (steady state 2.4W, drive state 3.2W at 6V DC)	
Dimensions (W/H/D)	53×51×100 mm	
Weight	215g	
Spurious radiation	FCC Class A	
Supplied accessary	2P harness, 6P harness, 10P harness	

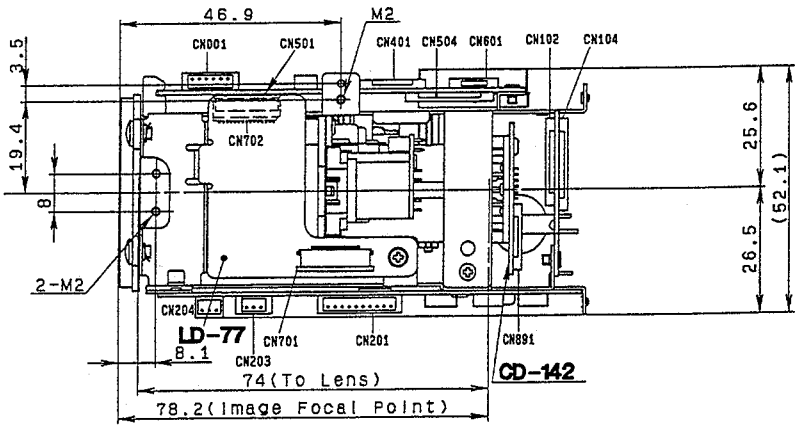
* Specifications are subject to change without notice.

3 Block Diagram

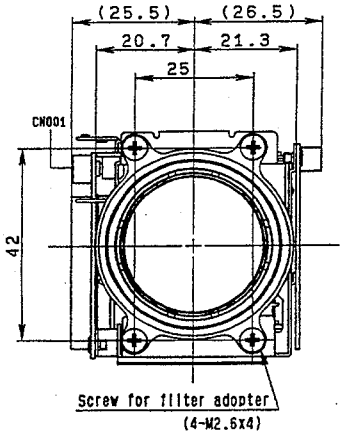


4 Dimensions

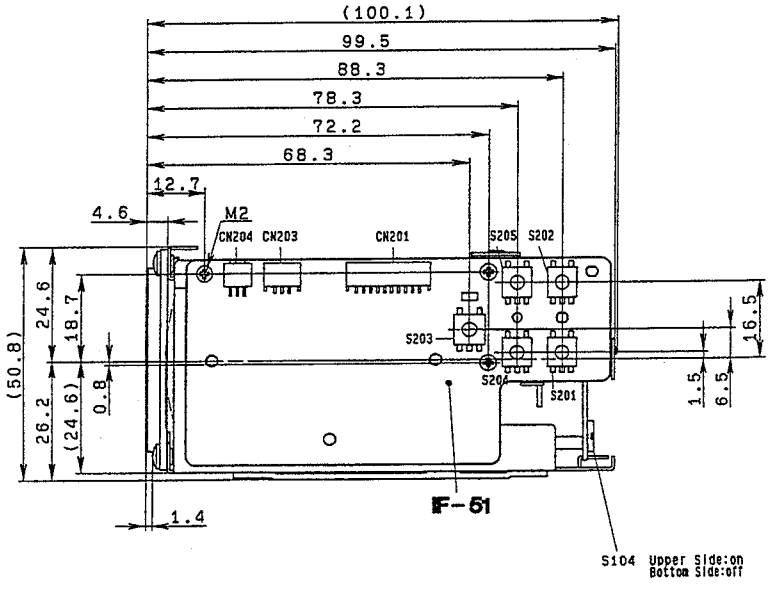
EVI-330V/331V



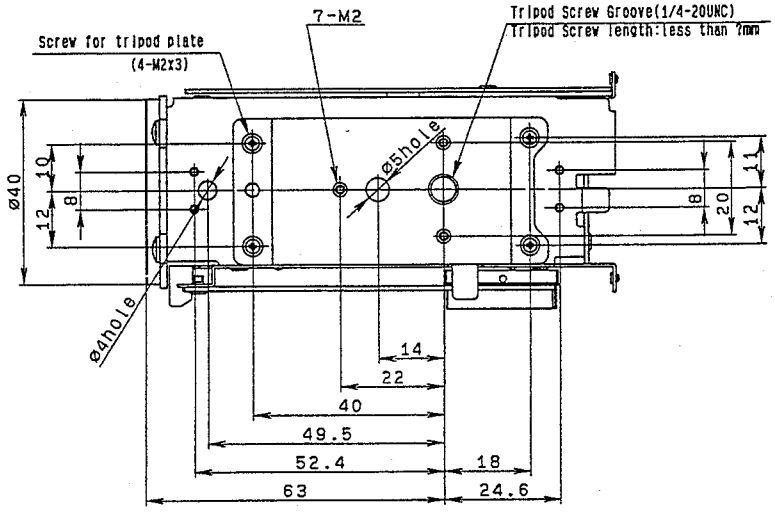
THE TOP FIGURE



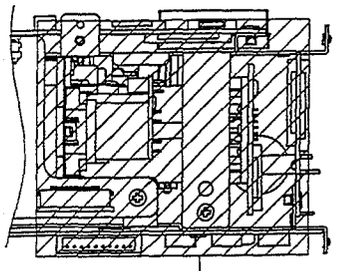
THE FRONT FIGURE



THE RIGHT SIDE FIGURE



THE BOTTOM FIGURE



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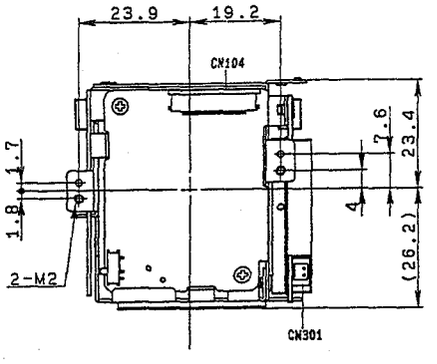
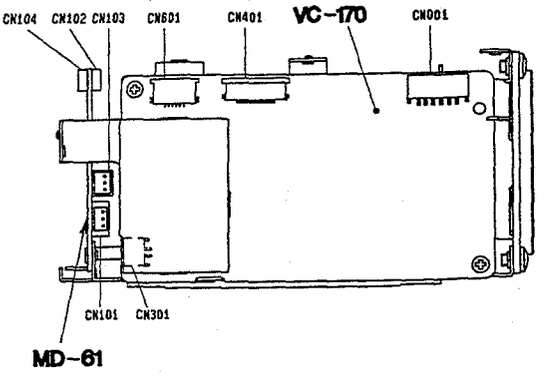


THE REAR FIGURE



THE LEFT SIDE FIGURE

5 List of Input/Output Pins

EVI-330V/331V

VC-170 Board

◇ CN001:6P For Video Output

1. GND
2. C OUT
3. GND
4. Y OUT
5. GND
6. VIDEO OUT

Board side:	JST	S6B-ZR-SM3A-TF
Housing:	JST	ZHR-6
Receptacle:	JST	SZH-003T-P0.5

◇ CN301:2P For power input

1. DC IN (6~12 V)
2. GND

Board side:	JST	S2B-ZR-SM3A-TF
Housing:	JST	ZHR-2
Receptacle:	JST	SZH-003T-P0.5

* CN502 and CN601 are not used.

MD-61 Board

◇ CN103:3P Connected to IF-51 Board (CN204). For lens control

1. ZOOM/FOCUS SW
2. GND
3. AF ON LED

Board side:	SMK	CGP4703-0110
Housing:	SMK	CGP1203-0101
Receptacle:	SMK	CTA1126-0101

◇ CN101:3P Connected to IF-51 Board (CN203). For ECCP and remote control

1. ECCP DC/UNREG OUT
2. ECCP SIG IN/OUT
3. GND

Board side:	JST	S3B-ZR-SM3A-TF
Housing:	JST	ZHR-3
Receptacle:	JST	SZH-003T-P0.5

* CN105, CN106, CN107 are not used.

IF-51 Board

The IF-51 board is mounted to the side of the EVI-330V/331V at shipment.
In this board, zoom, focus (key switch) and VISCA/RS232C control can be performed simply. For details, call SONY.
The IF-51 board and EVI-330V/331V are already connected by two 3P-3P harnesses.

◇ CN201:10P For connecting ES-232C control

1. TXD IN
2. DTR IN
3. DSR IN
4. RXD IN
5. TXD OUT
6. DTR OUT
7. DSR OUT
8. RXD OUT
9. GND
10. NC

Board side:	JST	S10B-ZR-SM3A-TF
		ZHR-10
		SZH-003T-P0.5

◇ CN203:3P For connecting EVI-EVI-330V/331V (MD-61 board, CN101)

1. ECCP DC/UNREG OUT
2. ECCP SIG IN/OUT
3. GND

Board side:	JST	S3B-ZR-SM3A-TF
Housing:	JST	ZHR-3
Receptacle:	JST	SZH-003T-P0.5

◇ CN204:3P Connected to EVI-330V/331V (MD-61 board, CN103)

1. ZOOM/FOCUS SW
2. GND
3. AF ON LED

Board side:	SMK	CGP4703-0110
Housing:	SMK	CGP1203-0101
Receptacle:	SMK	CTA1126-0101

The IF-51 board zoom and focus can be controlled simply (key switch).

6 Outline of Functions

The EVI-330V/331V has the following functions. For details of how to control these functions, refer to Chapters 7 and 8.

◇ Zoom

The stepping motor is adopted for the zoom motor.
The zoom rate of the EVI-330V/331V is 12 times. Zooming between tele (64.8 mm) and wide (5.4 mm) is possible.
Tele/wide can also be controlled manually.

◇ Focus

An inner focus system with superior follow-up is employed. The auto-focus adjusts the focus to high frequency components with high video signal level, that is components with high luminance and strong contrast in the measurement area.
Focus from the front of the lens (1 cm) (wide end) to infinity can be adjusted. The shortest focusing distance becomes longer the closer it is to the tele side. For tele, focus can be adjusted 80 cm from the front of the lens.

When using the following functions, the external circuit or VISCA/RS232C control is required. If these are not used, the auto-white balance and 1/60 sec shutter serve is standard. (For the EVI-331V, 1/50 sec shutter serves as the standard.)

◇ White Balance

Auto white balance (AWB)

For this unit's AWB, the TTL method is adopted to reproduce the natural colors of the subject as closely as possible by calculating the color data of the whole screen.
To prevent the subject from being all white by operating white balance function blindly, the operation range of auto white balance function is limited. This function also judges whether indoor or outdoor from the brightness and changes the withdraw range of auto white balance accordingly.

Preset white balance

The preset white balance can be selected from fixed indoors (3200K) and fixed outdoors (5800K).

One push white balance

The one push white balance is a function which, once the subject is set to certain lighting conditions, will expose the subject under these conditions by gaining white forcibly.
The color is reproduced naturally without being affected by the surrounding conditions of the subject.
When set, the one-push white balance trigger is sent assuming that the white subject occupies more than 1/2 of the screen.
The one-push white balance data is provided when the lithium backup SW is ON even though the power is off (2 hours for fully-charged battery). When the lithium backup SW is off, the data will be lost when the power is turned off. Therefore, when turning off the power, set the one-push white balance again.

◇ Automatic Exposure Mode

When the automatic exposure (AE) mode is set, the auto-iris, AGC (auto-gain), 1/60 sec shutter (EVI-331V is 1/50 sec shutter) will operate.
When the power is turned on with the lithium backup off, the automatic exposure mode will be set.

◇ Shutter Priority Automatic Exposure Mode

The iris value is automatically adjusted to the electronic shutter selected. Gain is also adjusted automatically.

1	1/60 (PAL:1/50)	11	1/300	21	1/1700
2	1/60	12	1/350	22	1/2000
3	1/75	13	1/425	23	1/2500
4	1/90	14	1/500	24	1/3000
5	1/100	15	1/600	25	1/3500
6	1/125 (PAL:1/120)	16	1/725	26	1/4000
7	1/150	17	1/850	27	1/6000
8	1/180	18	1/1000	28	1/10000
9	1/215	19	1/1250	29	
10	1/250	20	1/1500	30	

◇ Auto flickerless Function

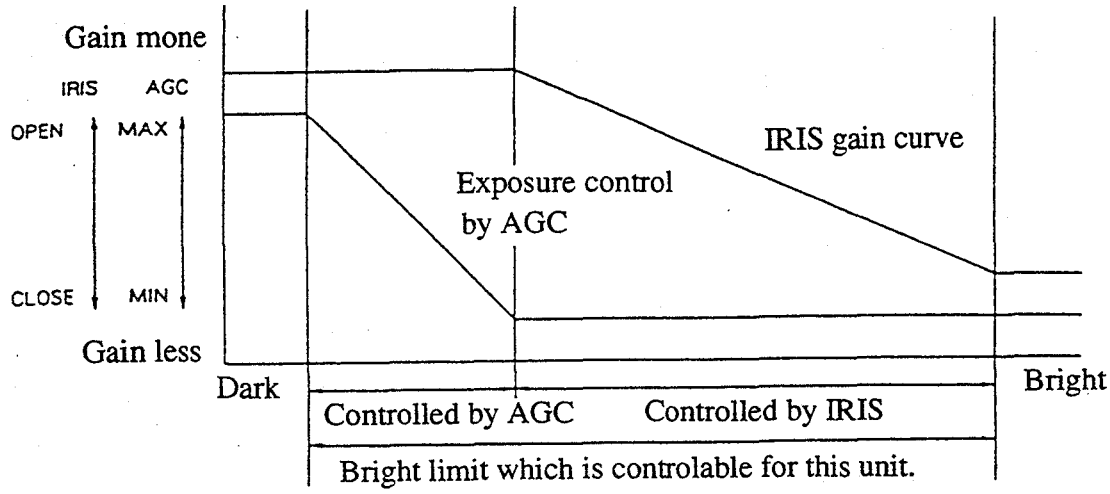
This unit is equipped with an auto flickerless function which automatically reduces flicker which occurs
when exposed under fluorescent light with a power frequency of 50 Hz. To completely eliminate flicker, set the shutter to 1/100 seconds.

◇ Backlight Compensation

The backlight compensation function increases the brightness in the automatic exposure mode and shutter priority exposure mode (auto-iris AGC). It is useful for correcting the images of subjects which have turned out dark due to background light (sunlight, lamps, etc.). The brightness when this function is off (auto iris, AGC) is taken as a reference, and the brightness can be increased up to 12 dB. Although the subject becomes brighter, the background will become white and saturate. The iris and gain operations remain in the auto mode.

◇ Bright Control

The bright control function adjusts brightness with both gain and iris.
Exposure is controlled by gain when dark and by iris when bright.
As both gain and iris are fixed, they are used when exposing at a fixed camera sensitivity. When switching from the automatic exposure mode or shutter priority automatic exposure mode to the bright mode, the state before switching is held momentary.



STEP	GAIN	IRIS	STEP	GAIN	IRIS	STEP	GAIN	IRIS
1	18dB	F1.8	9	0dB	F2.4	17	0dB	F9.6
2	15dB	F1.8	10	0dB	F2.8	18	0dB	F11
3	12dB	F1.8	11	0dB	F3.4	19	0dB	F14
4	9dB	F1.8	12	0dB	F4	20	0dB	F16
5	6dB	F1.8	13	0dB	F4.8	21	0dB	F19
6	3dB	F1.8	14	0dB	F5.6	22	0dB	F22
7	0dB	F1.8	15	0dB	F6.8	23	0dB	F28
8	0dB	F2.0	16	0dB	F8	24	0dB	CLOSE

◇ Shutter Priority Bright Control

When switching from the shutter priority bright control to the bright mode, the bright mode control can be performed while maintaining the shutter speed set in the shutter priority automatic exposure mode. When switched to the shutter priority automatic exposure mode, automatic exposure is started at the maintained shutter speed (both iris and gain are automatic).

◇ Position Preset

Camera functions can be preset in 6 different ways using the position preset function.
Using this function, zoom position, focus (auto, manual positions), white balance, shutter, bright control (iris, gain) can be set to the desired state instantaneously without adjusting backlight compensation each time.

◇ Factory Preset

The position preset function sets the camera functions to the factory preset state before preset and after reset. The full-auto state is set at shipment. By writing in the internal non-volatile memory using the factory preset function, data can be preserved semi-permanently.
Using this function, camera functions can be set freely before preset and after reset using the position preset function when the power is started up (when lithium backup is off).
As special tools are required for setting the factory preset, consult Sony for details.

* Note
When using factory preset, the camera will be out of warranty.

7. Function Control

Functions that can be controlled differ according to the control method used. For details of the function control, refer to Chapter 8.

Control method / Controlable functions	IF-51	RM-95	VISCA /RS232C
Zoom Tele/Wide	○	○	○
Zoom Position (Preset/Detect)			○
Focus Auto/Manual selection	○	○	○
Focus Far/Near	○	○	○
Focus Position (Detect)			○
White Balance mode selection			○
One Push White Balance (Preset)			○
White Balance mode detection			○
Bright Control Up/Down			○
Shutter Priority Up/Down			○
Shutter Priority (Preset)			○
Shutter Priority (Detect)			○
Position Preset (Preset/Reset)			○
Position Preset (Detect)			○

8. Control Methods

Camera Control Methods

◇ Power Supply

Supply 6.0V to 12.0V to CN301 (VC-170 board) using the harness provided.
Red (No. 1) is +.

◇ Video signal output

Composite video and Y/C video are output to CN001 (VC-170 board).

◇ Backup switch (MD-61 board S104)

- Zoom switches and focus positions (position preset) can be memorized in camera by turning on the backup switch.
- The backup battery is a re-chargeable battery.
- It can backup 2 weeks when fully charged.
- At shipment, it is set to off.

Function Control Methods

◇ IF-51 board

The IF-51 board can control the focus and zoom of the lens easily (key-switch) and has VISCA/ RS232C interfase.
The IF-51 board can be disconnected from the side frame of the camera.

Auto focus ON/OFF

- When the AF ON/OFF switch is pressed, ON/OFF is switched and the LED lights up when AF is ON.
- When the FOCUS FAR or NEAR switch is pressed when auto-focus is off, focus can be adjusted.

Zoom adjustment

Zoom (image angle) can be adjusted by pressing the zoom TELE or WIDE switch.

◇ ECCP (EVI camera control protocol)

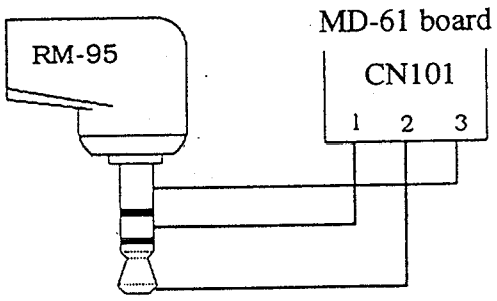
An ECCP terminal (MD-61 board CN101) is equipped for each function. These terminals can be controlled directly by serial communication (9600 bit/sec async bidirectional communication). When using, disconnect the 3P harness.)
The camera can be controlled and the camera data read. These terminals can be connected to the remote controller (RM-95). A contract is required if ECCP is to be used. For details, contact Sony.

◇ Using VISCA/RS232C Interface Board/IF-51

By using the interface board/IF-51, functions can be controlled using the RS232C board of computers, etc.
It is possible to control a camera and read the camera data.
For details of how to use, contact Sony.

◇ Using the Remote Controller RM-95

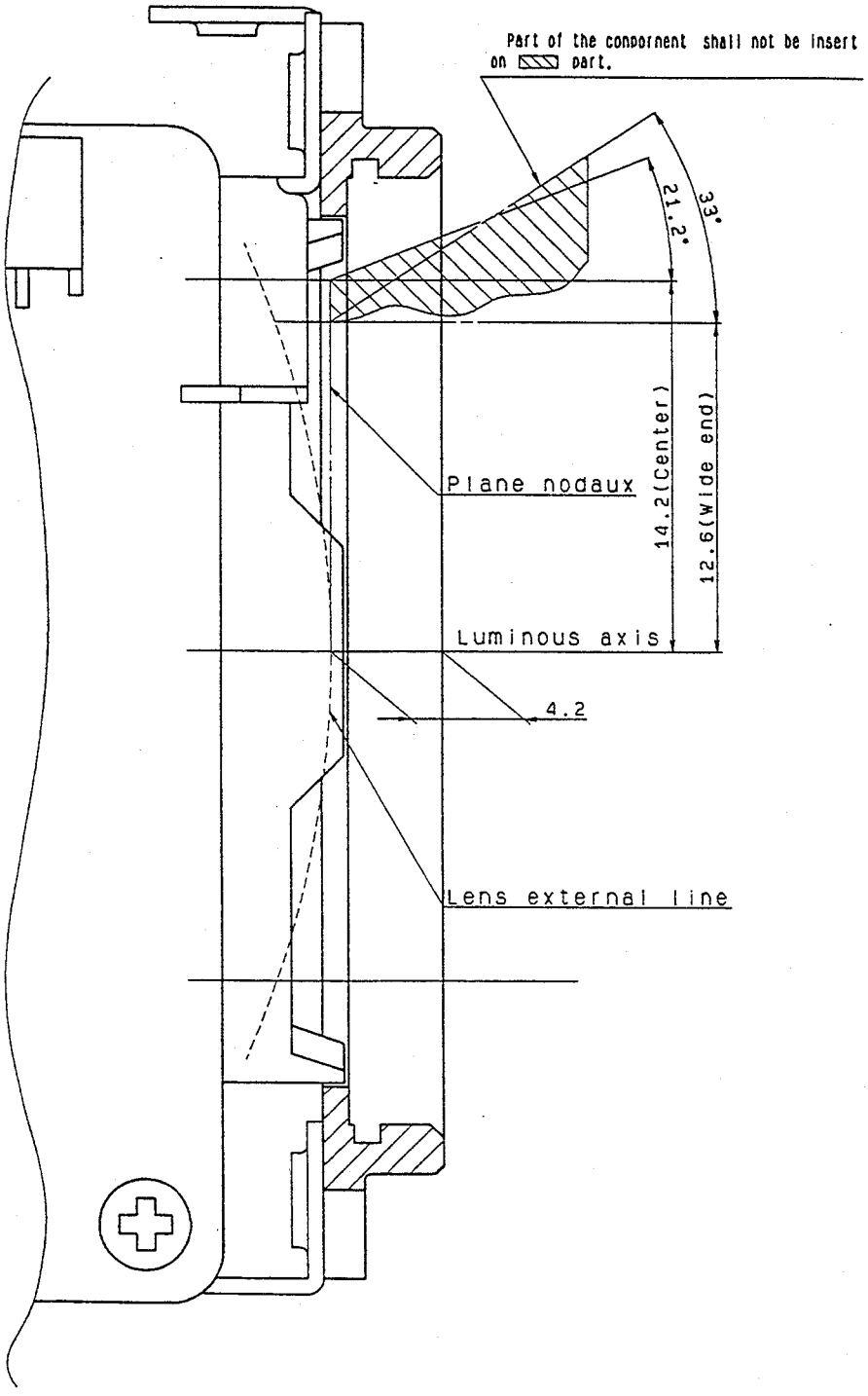
By using the Sony Camcorder remote controller (RM-95) on the market, zoom and focus can be controlled.
Connect to CN101 (3P, white) as follows.



9. Installation

◇ Installation

Use the screws for the tripod at the bottom or M2 screws of the chassis.
The plate for attaching the tripod on the bottom can be removed.
When designing the housing, etc., refer to the dimensional allowance as shown in the figure below.



10. Handling Precautions

- Do not apply bending force to the printed circuit board.
- Do not supply excessive voltage. (Max 13.2V)
  When more than 9V is used, the camera will become hot. Do not suspect a fault.
- When touching the board, to prevent electrostatic discharge failure, use the ground-band. When packaging it, use the anti-electrostatic packaging.
- When transporting the unit, place it in the carton box in which it was shipped from Sony.
- For factory preset and when adjustments are performed, the camera will be out of warranty.

11. Others

- External synchronization is not available. RGB output is not available.
- The zoom limiter (TELE side/WIDE side) and proximity focus limiter can be set as camera functions.
  For details, contact Sony.
- For camera functions, the iris priority mode, gain priority mode, and exposure compensation are not adopted.

12. Optional Accessories

◇ Attachment lens

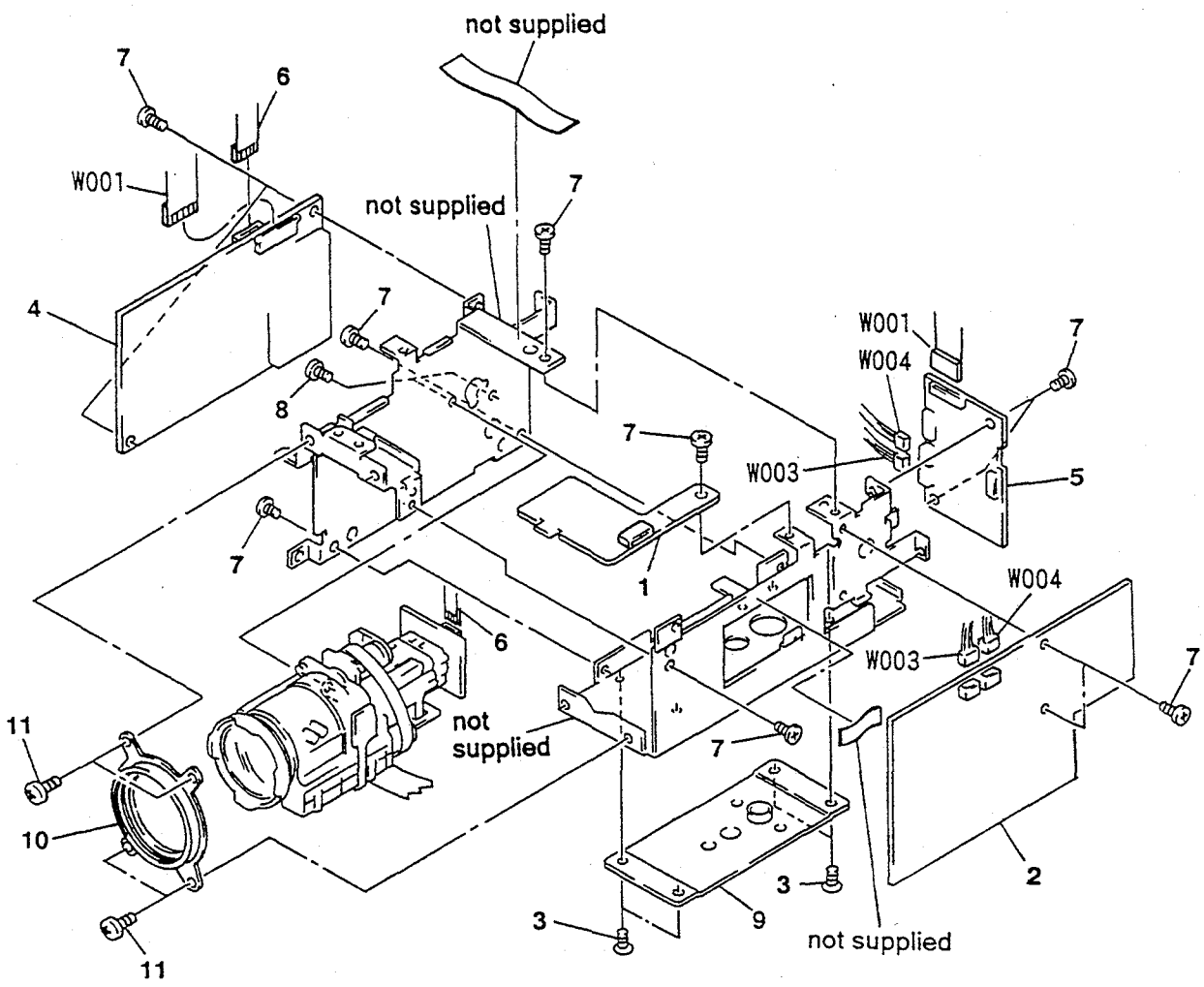
A 37 mm diameter accessory screw is attached at the front of the lens so that Camcorder conversion lens, such as wide conversion lens, close-up lens, etc. can be attached.

2. EXPLODED VIEWS

NOTE:

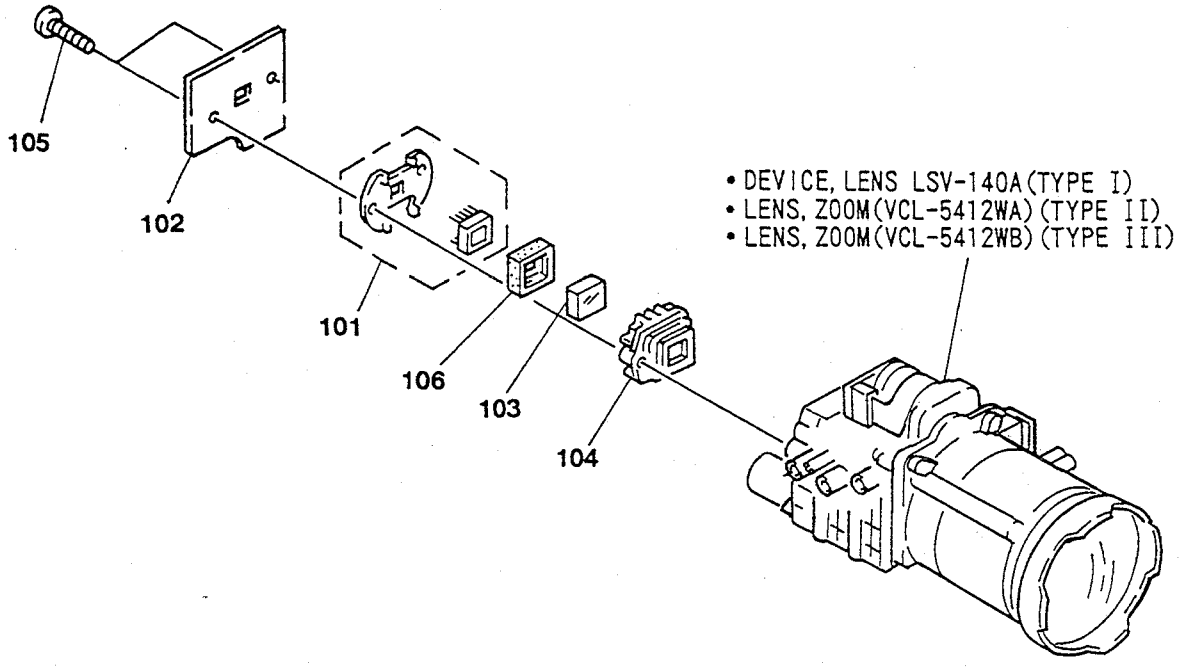
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.
- Canadian model is abbreviated as CND.

2-1. MAIN ASSEMBLY



Ref. No.	Part No.	Description	Remark
* 1	A-7072-288-A	LD-77(A) BOARD, COMPLETE (EVI-330V)	
* 1	A-7072-292-A	LD-77(B) BOARD, COMPLETE (EVI-331V)	
* 2	A-7072-733-A	IF-51(A) BOARD, COMPLETE	
3	7-627-452-18	SCREW, PRECISION +K 2X3	
* 4	A-7072-748-A	VC-170(G) BOARD, COMPLETE (EVI-330V)	
* 4	A-7072-749-A	VC-170(H) BOARD, COMPLETE (EVI-331V)	
* 5	A-7072-734-A	MD-61(E) BOARD, COMPLETE	
6	1-657-183-11	FP-314 FLEXIBLE BOARD	
7	3-713-786-51	SCREW (M2X3)	
8	3-719-601-01	SCREW (B2X5), TAPPING	
* 9	3-956-679-01	SHEET METAL, TRIPOD	
* 10	3-956-683-11	ADAPTOR, F FITTING	
11	7-621-775-10	SCREW +B 2.6X4	
W001	1-775-320-11	CABLE, FLEXIBLE FLAT (FFC-170)	
* W003	1-952-480-11	HARNESS (FK-56)	
* W004	1-952-458-12	HARNESS (VI-51)	

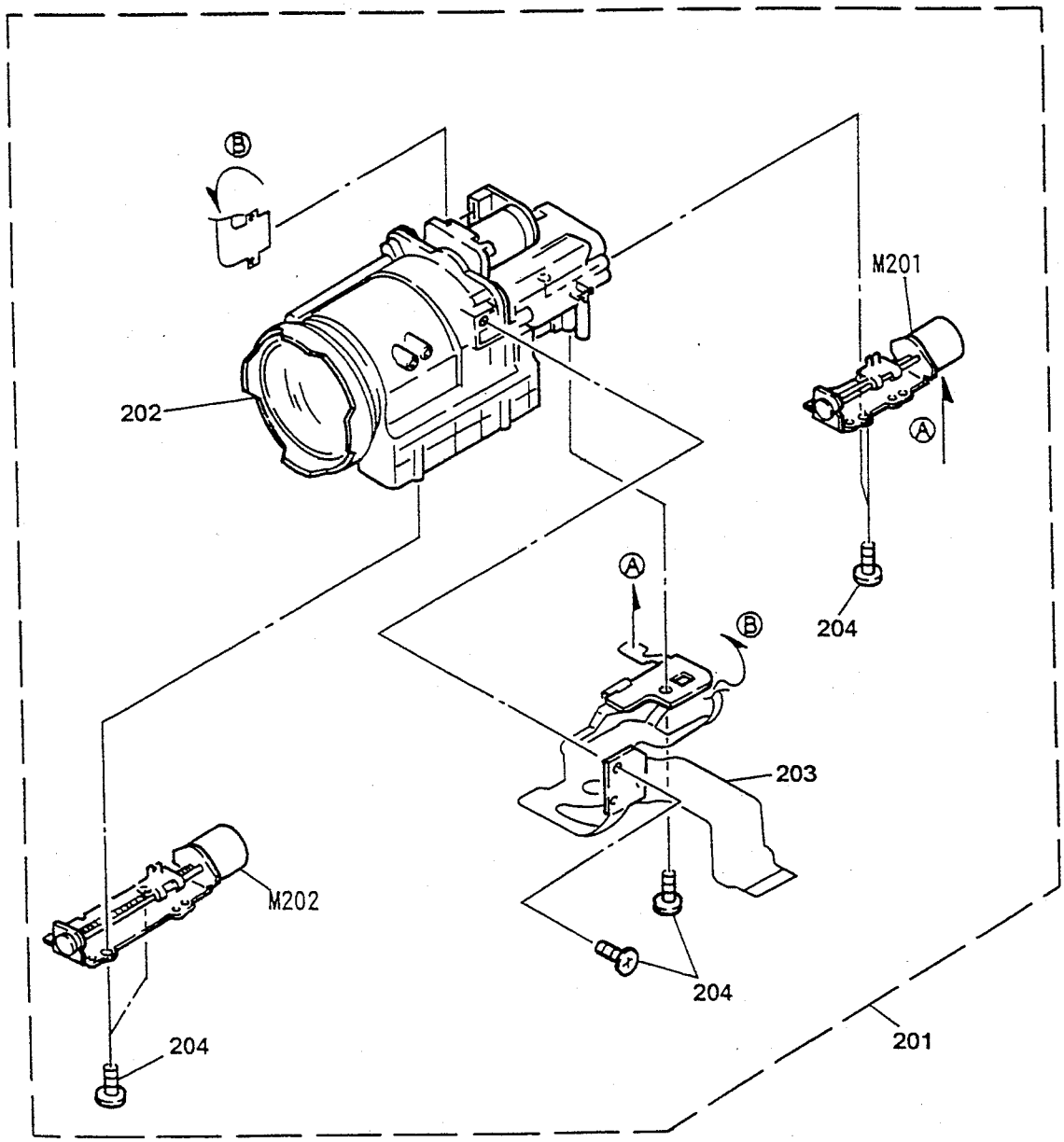
2-2. CCD BLOCK ASSEMBLY



Ref. No.	Part No.	Description	Remark
101	A-7030-370-A	CCD BLOCK ASSY (AUTO)(EVI-330)	
101	A-7030-371-A	CCD BLOCK ASSY (AUTO)(EVI-331)	
101	A-7030-373-A	CCD BLOCK ASSY (AUTO)(EVI-330T)	
101	A-7030-495-A	CCD BLOCK ASSY (AUTO)(EVI-331T)	
* 102	A-7072-290-A	CD-142(A) BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remark
103	1-547-735-51	FILTER BLOCK, OPTICAL	
104	3-946-856-11	ADAPTOR (H), CCD FITTING	
105	3-947-268-01	2, +B TAPPING P TAIT	
106	3-960-149-11	RUBBER (3), SEAL	

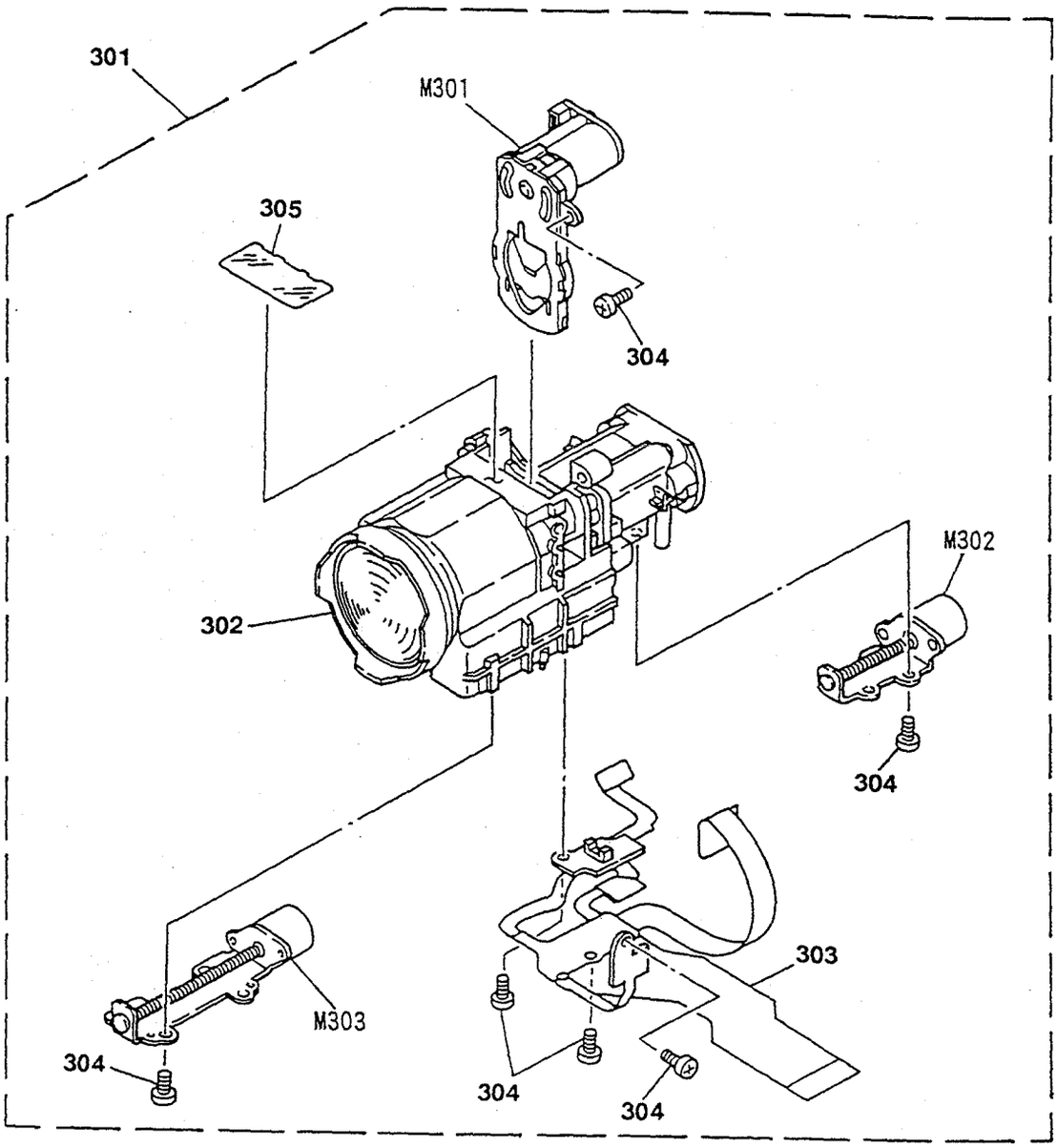
2-3. ZOOM LENS ASSEMBLIES (LSV-140A) (TYPE I)



Ref. No.	Part No.	Description	Remark
201	8-848-704-01	DEVICE, LENS LSV-140A	
202	A-4910-598-A	DEVICE ASSY, LSV-140A (RP)	
203	A-4915-338-A	FLEXIBLE MOUNT	
204	3-713-791-41	SCREW (M1.7X5), TAPPING, P2	

Ref. No.	Part No.	Description	Remark
M201	1-698-364-01	MOTOR ASSY, FOCUS	
M202	1-698-363-01	MOTOR ASSY, ZOOM	

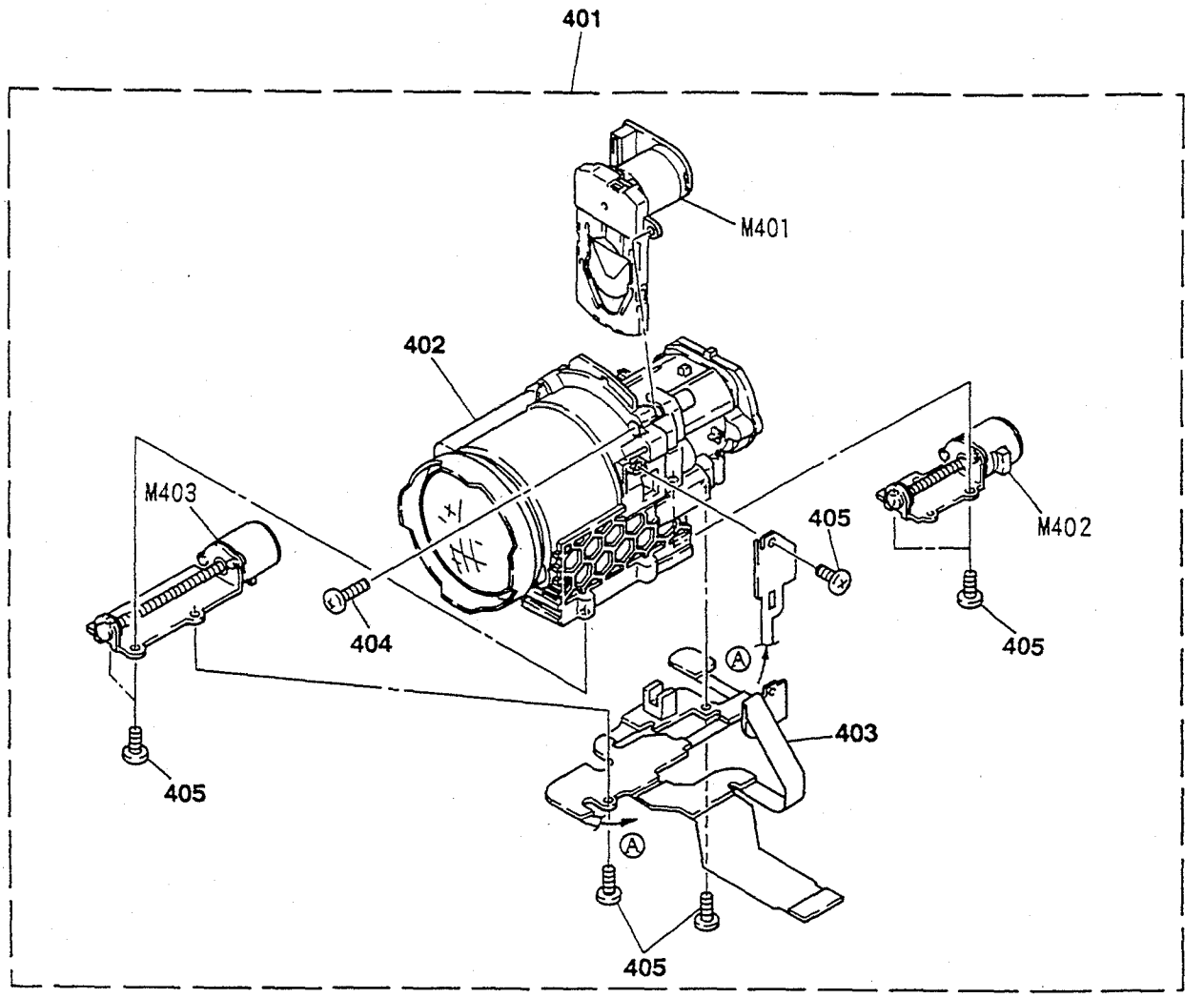
2-4. ZOOM LENS ASSEMBLIES (VCL-5412WA) (TYPE Ⅱ)



Ref. No.	Part No.	Description	Remark
301	1-547-716-11	LENS, ZOOM (VCL-5412WA) (TYPE II)	
302	3-708-891-01	TUBE, MIRROR ASSY	
303	3-708-890-01	FLEXIBLE, MAIN	
304	3-708-902-01	SCREW (BT3 P1.7X4C)	
305	3-708-886-01	COVER, IG	

Ref. No.	Part No.	Description	Remark
M301	3-708-888-01	METER, IG	
M302	3-708-889-01	MOTOR ASSY, FOCUS	
M303	3-708-887-01	MOTOR ASSY, ZOOM	

2-5. ZOOM LENS ASSEMBLIES (VCL-5412WB) (TYPE Ⅲ)



Ref. No.	Part No.	Description	Remark
401	1-547-739-11	LENS, ZOOM (VCL-5412WB) (TYPE III)	
402	3-708-900-01	TUBE, MIRROR ASSY	
403	3-708-899-01	PC BOARD ASSY, FLEXIBLE	
404	3-708-617-01	SCREW (BT3 P1.7X7C)	
405	3-708-902-01	SCREW (BT3 P1.7X4C)	

Ref. No.	Part No.	Description	Remark
M401	3-708-898-01	IRIS ASSY	
M402	3-708-897-01	MOTOR ASSY, FOCUS	
M403	3-708-896-01	MOTOR ASSY, ZOOM	

3. ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH
- *Canadian model is abbreviated as CND.*

Ref. No.	Part No.	Description			Remark
*	A-7072-290-A	CD-142 (A) BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C891	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V
C892	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V
C894	1-164-346-11	CERAMIC CHIP	1uF		16V
C895	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C896	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
		< CONNECTOR >			
CN891	1-750-340-21	CONNECTOR, FFC/EPC (ZIF) 16P			
		< COIL >			
L891	1-412-963-11	INDUCTOR 100uH			
		< TRANSISTOR >			
Q891	8-729-232-86	TRANSISTOR	2SK1875-BL/V		
Q892	8-729-117-73	TRANSISTOR	2SC4178-F14		
		< RESISTOR >			
R892	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R893	1-216-840-11	METAL CHIP	39K	5%	1/16W
R894	1-216-820-11	METAL CHIP	820	5%	1/16W
R895	1-216-845-11	METAL CHIP	100K	5%	1/16W
R896	1-216-809-11	METAL CHIP	100	5%	1/16W
R897	1-216-833-11	METAL CHIP	10K	5%	1/16W
**********					
*	A-7072-733-A	IF-51 (A) BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C201	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C202	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C204	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C205	1-124-778-11	ELECT CHIP	22uF	20%	6.3V
C206	1-126-395-11	ELECT	22uF	20%	16V
C207	1-126-395-11	ELECT	22uF	20%	16V
C208	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C210	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C211	1-124-778-11	ELECT CHIP	22uF	20%	6.3V
C212	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C214	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C221	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C222	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C225	1-164-360-11	CERAMIC CHIP	0.1uF		16V
		< CONNECTOR >			
CN201	1-695-223-21	PIN, CONNECTOR (SMD) 10P			
* CN203	1-580-056-21	PIN, CONNECTOR 3P			
* CN204	1-750-502-11	PIN, CONNECTOR (1.5MM) (SMD) 3P			
		< DIODE >			
D201	8-719-941-09	DIODE	DAP202U		
D205	8-719-800-76	DIODE	1SS226		
D206	8-719-800-76	DIODE	1SS226		
D207	8-719-026-39	DIODE	CL-150UR-CD		
D208	8-719-026-39	DIODE	CL-150UR-CD		
		< IC >			
IC201	8-759-521-15	IC	MAX232CWE		
IC202	8-759-255-10	IC	MB89715AHPF-G-498		
IC203	8-759-242-66	IC	TC4W66F-TF121		
IC204	8-759-253-14	IC	MB89131-165		
IC206	8-759-074-40	IC	PST572DMT-TI		
		< COIL >			
L201	1-410-381-11	INDUCTOR CHIP 10uH			
		< TRANSISTOR >			
Q201	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
Q202	8-729-905-18	TRANSISTOR	DTC144EU		
Q203	8-729-905-18	TRANSISTOR	DTC144EU		
Q204	8-729-905-18	TRANSISTOR	DTC144EU		
Q206	8-729-905-18	TRANSISTOR	DTC144EU		
Q209	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
Q210	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
Q211	8-729-905-12	TRANSISTOR	DTA144EU		
Q212	8-729-905-18	TRANSISTOR	DTC144EU		

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R201	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R202	1-216-841-11	METAL CHIP	47K	5%	1/16W
R203	1-216-821-11	METAL CHIP	1K	5%	1/16W
R204	1-216-841-11	METAL CHIP	47K	5%	1/16W
R205	1-216-821-11	METAL CHIP	1K	5%	1/16W
R206	1-216-833-11	METAL CHIP	10K	5%	1/16W
R207	1-216-833-11	METAL CHIP	10K	5%	1/16W
R208	1-216-821-11	METAL CHIP	1K	5%	1/16W
R210	1-216-864-11	METAL CHIP	0	5%	1/16W
R211	1-216-864-11	METAL CHIP	0	5%	1/16W
R213	1-216-864-11	METAL CHIP	0	5%	1/16W
R214	1-216-864-11	METAL CHIP	0	5%	1/16W
R215	1-216-841-11	METAL CHIP	47K	5%	1/16W
R217	1-216-841-11	METAL CHIP	47K	5%	1/16W
R219	1-216-841-11	METAL CHIP	47K	5%	1/16W
R221	1-216-864-11	METAL CHIP	0	5%	1/16W
R222	1-216-864-11	METAL CHIP	0	5%	1/16W
R223	1-216-841-11	METAL CHIP	47K	5%	1/16W
R224	1-216-864-11	METAL CHIP	0	5%	1/16W
R225	1-216-864-11	METAL CHIP	0	5%	1/16W
R227	1-216-864-11	METAL CHIP	0	5%	1/16W
R228	1-216-864-11	METAL CHIP	0	5%	1/16W
R231	1-216-841-11	METAL CHIP	47K	5%	1/16W
R232	1-216-841-11	METAL CHIP	47K	5%	1/16W
R233	1-216-849-11	METAL CHIP	220K	5%	1/16W
R234	1-216-841-11	METAL CHIP	47K	5%	1/16W
R235	1-216-841-11	METAL CHIP	47K	5%	1/16W
R236	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R237	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R238	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R239	1-216-833-11	METAL CHIP	10K	5%	1/16W
		< SWITCH >			
S201	1-572-078-23	SWITCH, TACTILE			
S202	1-572-078-23	SWITCH, TACTILE			
S203	1-572-078-23	SWITCH, TACTILE			
S204	1-572-078-23	SWITCH, TACTILE			
S205	1-572-078-23	SWITCH, TACTILE			
**********					
*	A-7072-288-A	LD-77(A) BOARD, COMPLETE (EVI-330V)			
		**********			
*	A-7072-292-A	LD-77(B) BOARD, COMPLETE (EVI-331V)			
		**********			
		< CAPACITOR >			
C701	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C702	1-162-971-11	CERAMIC CHIP	0.001uF	10%	50V
C703	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C704	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C705	1-162-971-11	CERAMIC CHIP	0.001uF	10%	50V
C706	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C707	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C708	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C709	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C710	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C711	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C712	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C713	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C714	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C715	1-162-974-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN701	1-766-833-21	CONNECTOR, FFC/FPC (ZIF) 21P			
CN702	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P			
		< IC >			
IC701	8-759-701-24	IC NJM3414M			
IC702	8-759-247-07	IC MPC17A34VMEL			
IC703	8-759-058-50	IC BA10324AF-E2			
IC704	8-752-365-65	IC CXD2126N-T4			
IC705	8-759-209-15	IC TC4SU69F			
		< COIL >			
L701	1-412-062-11	INDUCTOR CHIP 47uH			
L702	1-412-058-11	INDUCTOR CHIP 10uH			
L703	1-412-058-11	INDUCTOR CHIP 10uH			
		< TRANSISTOR >			
Q701	8-729-230-63	TRANSISTOR 2SC4116-YG			
Q702	8-729-015-76	TRANSISTOR UN5211-TX			
		< RESISTOR >			
R701	1-216-809-11	METAL CHIP	100	5%	1/16W
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W
R703	1-216-845-11	METAL CHIP	100K	5%	1/16W
R704	1-216-848-11	METAL CHIP	180K	5%	1/16W
R705	1-216-855-11	METAL CHIP	680K	5%	1/16W
R706	1-216-848-11	METAL CHIP	180K	5%	1/16W
R707	1-216-833-11	METAL CHIP	10K	5%	1/16W
R708	1-216-837-11	METAL CHIP	22K	5%	1/16W
R709	1-216-837-11	METAL CHIP	22K	5%	1/16W
R710	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R711	1-216-841-11	METAL CHIP	47K	5%	1/16W
R712	1-216-841-11	METAL CHIP	47K	5%	1/16W
R713	1-216-820-11	METAL CHIP	820	5%	1/16W
R714	1-216-837-11	METAL CHIP	22K	5%	1/16W
R715	1-216-841-11	METAL CHIP	47K	5%	1/16W

Ref. No.	Part No.	Description				Remark
R716	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R717	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R718	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R719	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R720	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R721	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R723	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R724	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R725	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R726	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R727	1-218-865-11	METAL CHIP	5.6K	0.50%	1/16W	
R728	1-218-855-11	METAL CHIP	2.2K	0.50%	1/16W	
R729	1-216-864-11	METAL CHIP	0	5%	1/16W	(EVI-331V)
R730	1-216-864-11	METAL CHIP	0	5%	1/16W	(EVI-330V)

****

* A-7072-734-A MD-61(E) BOARD, COMPLETE
****

< BATTERY >

BT101	1-528-330-11	BATTERY, LITHIUM (SECONDARY)				

< CAPACITOR >

C101	1-164-346-11	CERAMIC CHIP	1uF		16V	
C102	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C103	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C104	1-107-685-11	TANTAL. CHIP	15uF	20%	6.3V	
C105	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C106	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C107	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C108	1-135-091-91	TANTAL. CHIP	1uF	20%	16V	
C109	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C110	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C111	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C112	1-104-851-11	TANTAL. CHIP	10uF	20%	10V	
C113	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C114	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C115	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C116	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C117	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C126	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C127	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C128	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	

< CONNECTOR >

* CN101	1-580-056-21	PIN, CONNECTOR 3P	
CN102	1-774-201-21	CONNECTOR, FFC/FPC 25P	
* CN103	1-750-502-11	PIN, CONNECTOR (1.5MM) (SMD) 3P	
CN104	1-766-843-21	CONNECTOR, FFC/FPC (ZIF) 27P	

< DIODE >

D101	8-719-938-72	DIODE	SB01-05CP
D104	8-719-027-50	DIODE	MA142WK-(TX)
D105	8-719-421-27	DIODE	MA728
D106	8-719-421-27	DIODE	MA728
D107	8-719-421-27	DIODE	MA728
D108	8-719-422-91	DIODE	MA8091
D109	8-719-422-91	DIODE	MA8091

< IC >

IC101	8-759-446-59	IC	MB89098RPFV-G-146-GND
IC102	8-759-278-57	IC	AK6420HF-E2
IC103	8-759-295-62	IC	S-8423DFS-T2
IC104	8-759-059-05	IC	TL1596CPW-ELM1000
IC105	8-759-259-77	IC	PQ20VZ5U

< COIL >

L101	1-414-081-11	INDUCTOR 33uH	

< IC LINK >

PS101	1-576-123-21	RINK, IC	

< TRANSISTOR >

Q101	8-729-026-53	TRANSISTOR	2SA1576A-T106-QR
Q102	8-729-905-18	TRANSISTOR	DTC144EU
Q103	8-729-028-91	TRANSISTOR	DTA144EUA-T106

< RESISTOR >

R101	1-216-295-11	METAL CHIP	0	5%	1/10W	
R102	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R103	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R104	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R105	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R106	1-218-839-11	METAL GLAZE	470	0.50%	1/16W	
R107	1-218-833-11	METAL GLAZE	270	0.50%	1/16W	
R108	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R109	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R110	1-216-864-11	METAL CHIP	0	5%	1/16W	
R112	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R113	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R114	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R115	1-216-817-11	METAL CHIP	470	5%	1/16W	
R116	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R117	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R118	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R119	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R120	1-216-864-11	METAL CHIP	0	5%	1/16W	
R121	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	

Ref.No.	Part No.	Description				Remark
R123	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R124	1-216-809-11	METAL CHIP	100	5%	1/16W	
R125	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R126	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R127	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R128	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R131	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R132	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R133	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R134	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R135	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R136	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R138	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R139	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R140	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R141	1-216-049-11	METAL CHIP	1K	5%	1/10W	
R151	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R152	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R153	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R156	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R158	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R159	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R160	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R161	1-216-811-11	METAL CHIP	150	5%	1/16W	
R162	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R163	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R164	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R165	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R169	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R170	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R171	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R172	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R173	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R177	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R179	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R180	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R181	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R182	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R183	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R184	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R185	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R186	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R187	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R188	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R189	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R190	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R191	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R192	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R193	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R194	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R195	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R196	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R197	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R198	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R199	1-216-833-11	METAL CHIP	10K	5%	1/16W	
		< SWITCH >				
S104	1-571-275-31	SWITCH, SLIDE				
		< VIBRATOR >				
X101	1-760-458-21	VIBRATOR, CRYSTAL				
XTL101	1-579-369-21	VIBRATOR				
**********						
*	A-7072-748-A	VC-170 (G) BOARD, COMPLETE (EVI-330V)				
		**********				
*	A-7072-749-A	VC-170 (H) BOARD, COMPLETE (EVI-331V)				
		**********				
		< CAPACITOR >				
C001	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C002	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C004	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C005	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C006	1-135-338-11	TANTAL. CHIP	220uF	20%	4V	
C007	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C008	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C009	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C010	1-135-338-11	TANTAL. CHIP	220uF	20%	4V	
C011	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C012	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C013	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C014	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C017	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C019	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C301	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C302	1-164-315-11	CERAMIC CHIP	470PF	5%	50V	
C304	1-104-916-11	TANTAL. CHIP	6.8uF	20%	20V	
C307	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C309	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C310	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C311	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V	
C312	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C313	1-164-730-11	CERAMIC CHIP	0.0012uF	10%	50V	
C315	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C316	1-162-962-11	CERAMIC CHIP	470PF	10%	50V	
C317	1-162-962-11	CERAMIC CHIP	470PF	10%	50V	
C318	1-162-962-11	CERAMIC CHIP	470PF	10%	50V	

Ref.No.	Part No.	Description			Remark
C319	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C320	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C321	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C322	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C323	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C326	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C327	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C328	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C329	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C330	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C331	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C332	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C333	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C334	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C335	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C336	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C339	1-162-638-11	CERAMIC CHIP	1uF		16V
C340	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C401	1-162-637-11	CERAMIC CHIP	0.47uF		16V
C402	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C403	1-164-346-11	CERAMIC CHIP	1uF		16V
C404	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C405	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C406	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C407	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C408	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V
C409	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C410	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C411	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C412	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C413	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C414	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C415	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C418	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C420	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C421	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C422	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C423	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C424	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C425	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C426	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V
C427	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C428	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C429	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V
C430	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C434	1-164-346-11	CERAMIC CHIP	1uF		16V
C435	1-164-346-11	CERAMIC CHIP	1uF		16V
C436	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C437	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C501	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C502	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C503	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C506	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C508	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C509	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C511	1-107-685-11	TANTAL. CHIP	15uF	20%	6.3V
C512	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C514	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C515	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C516	1-164-360-11	CERAMIC CHIP	0.1uF		16V (EVI-331V)
C518	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C519	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C524	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C525	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C526	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C527	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C528	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C529	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C530	1-164-346-11	CERAMIC CHIP	1uF		16V
C531	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C532	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
		< CONNECTOR >			
CN001	1-580-789-21	PIN, CONNECTOR (SMD) 6P			
* CN301	1-580-055-21	PIN, CONNECTOR 2P			
CN401	1-750-340-21	CONNECTOR, FFC/EPC (ZIF) 16P			
CN501	1-691-519-11	CONNECTOR, BOARD TO BOARD 30P			
CN504	1-774-202-21	CONNECTOR, FFC/FPC 25P			
		< TRIMMER >			
CT401	1-141-356-11	CAP, ADJ			
		< DIODE >			
D001	8-719-027-50	DIODE	MA142WK-(TX)		
D302	8-719-027-77	DIODE	MA796-TX		
D401	8-719-404-49	DIODE	MA111		
D402	8-719-404-49	DIODE	MA111		
D403	8-719-404-49	DIODE	MA111		
D404	8-719-404-49	DIODE	MA111		
		< FILTER >			
FL501	1-239-352-11	FILTER, LOW PASS			
		< IC >			
IC001	8-752-055-95	IC	CXA1409AQ		
IC302	8-759-060-94	IC	MB3785APFV-G-BND-ER		
IC401	8-752-372-14	IC	CXD1267AN-T4		
IC402	8-752-374-25	IC	CXD2415R-T4		
IC403	8-752-073-11	IC	CXA2006Q-T4		

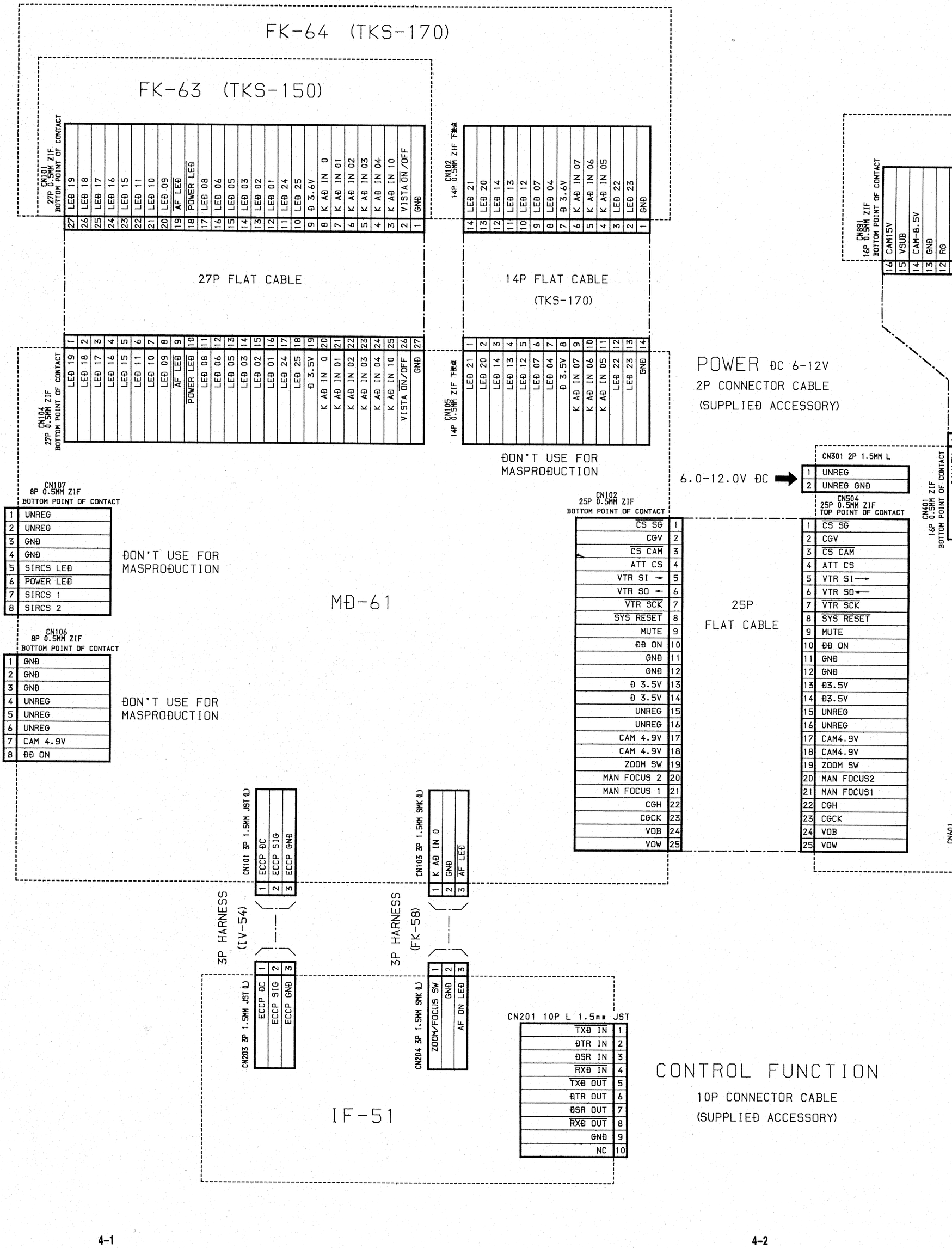
Ref.No.	Part No.	Description	Remark
IC404	8-759-064-36	IC MB88346BPFV	
IC405	8-752-373-69	IC CXD2407BR-T4	
IC406	8-759-331-07	IC AD43021-REEL	
IC501	8-759-278-57	IC AK6420HF-E2	
IC502	8-759-391-14	IC MC68HC11MA8FU-SC424624FU	
IC503	8-752-374-94	IC CXD2150BR-T6	
IC504	8-752-376-21	IC CXD2151AR-T6	
IC505	8-759-262-36	IC CXD2133BR-T6	
		< COIL >	
L001	1-412-058-11	INDUCTOR CHIP 10uH	
L002	1-500-113-11	BEAD, FERRITE (CHIP)	
L003	1-500-113-11	BEAD, FERRITE (CHIP)	
L004	1-500-113-11	BEAD, FERRITE (CHIP)	
L304	1-424-653-11	COIL, CHOKE 10uH	
L305	1-424-653-11	COIL, CHOKE 10uH	
L306	1-424-674-11	COIL, CHOKE 22uH	
L307	1-424-674-11	COIL, CHOKE 22uH	
L308	1-424-674-11	COIL, CHOKE 22uH	
L309	1-412-026-11	INDUCTOR CHIP 1uH	
L310	1-412-033-11	INDUCTOR CHIP 220uH	
L311	1-412-033-11	INDUCTOR CHIP 220uH	
L313	1-412-028-11	INDUCTOR CHIP 4.7uH	
L315	1-412-028-11	INDUCTOR CHIP 4.7uH	
L401	1-412-058-11	INDUCTOR CHIP 10uH	
L402	1-414-078-11	INDUCTOR 10uH	
L403	1-412-058-11	INDUCTOR CHIP 10uH	
L404	1-414-078-11	INDUCTOR 10uH	
L405	1-414-078-11	INDUCTOR 10uH	
L501	1-412-058-11	INDUCTOR CHIP 10uH	
L502	1-414-078-11	INDUCTOR 10uH	
L503	1-414-078-11	INDUCTOR 10uH	
L504	1-414-078-11	INDUCTOR 10uH	
L505	1-412-959-11	INDUCTOR 47uH (EVI-331V)	
L505	1-412-961-11	INDUCTOR 68uH (EVI-330V)	
L506	1-414-078-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q304	8-729-106-60	TRANSISTOR 2SB1115A	
Q305	8-729-823-84	TRANSISTOR FP102	
Q306	8-729-823-84	TRANSISTOR FP102	
Q307	8-729-823-84	TRANSISTOR FP102	
Q308	8-729-403-35	TRANSISTOR UN5113	
Q401	8-729-403-27	TRANSISTOR XN4401	
Q501	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q502	8-729-420-24	TRANSISTOR 2SB1218A-QRS	
Q503	8-729-230-63	TRANSISTOR 2SC4116-YG	
Q504	8-729-420-24	TRANSISTOR 2SB1218A-QRS	

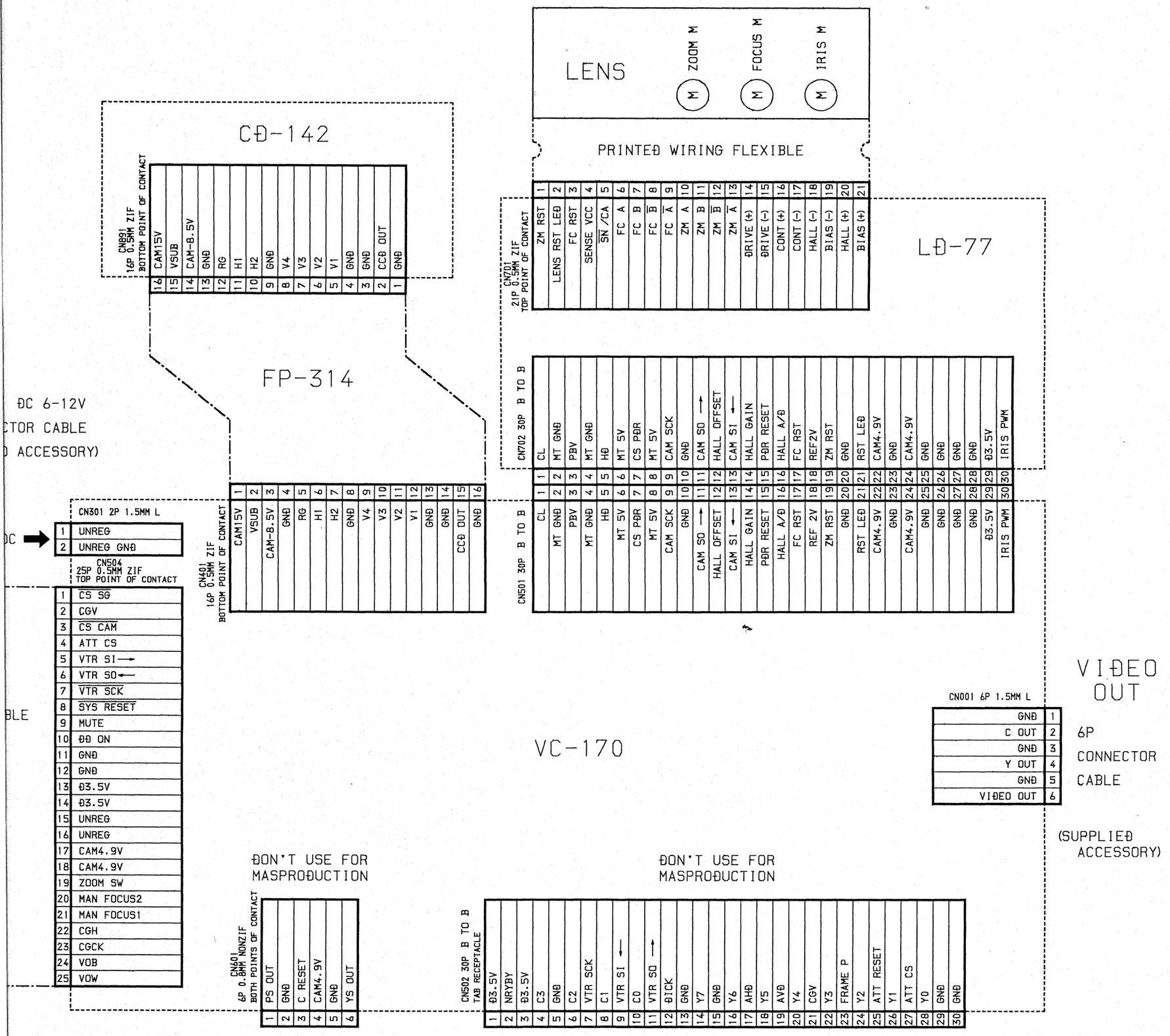
Ref.No.	Part No.	Description	Remark
		< RESISTOR >	
R001	1-216-807-11	METAL CHIP 68 5% 1/16W	
R005	1-216-807-11	METAL CHIP 68 5% 1/16W	
R006	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R007	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R008	1-216-807-11	METAL CHIP 68 5% 1/16W	
R009	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R010	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R011	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R012	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R032	1-216-864-11	METAL CHIP 0 5% 1/16W	
R033	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R302	1-218-862-11	METAL CHIP 4.3K 0.50% 1/16W	
R303	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R306	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R307	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R310	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R312	1-218-876-11	METAL CHIP 16K 0.50% 1/16W	
R313	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R314	1-218-874-11	METAL CHIP 13K 0.50% 1/16W	
R315	1-218-891-11	METAL CHIP 68K 0.50% 1/16W	
R316	1-218-875-11	METAL CHIP 15K 0.50% 1/16W	
R318	1-218-885-11	METAL CHIP 39K 0.50% 1/16W	
R319	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R320	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R321	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R322	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R323	1-218-879-11	METAL CHIP 22K 0.50% 1/16W	
R325	1-218-875-11	METAL CHIP 15K 0.50% 1/16W	
R326	1-218-873-11	METAL CHIP 12K 0.50% 1/16W	
R327	1-218-881-11	METAL CHIP 27K 0.50% 1/16W	
R329	1-218-865-11	METAL CHIP 5.6K 0.50% 1/16W	
R330	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R332	1-218-875-11	METAL CHIP 15K 0.50% 1/16W	
R333	1-216-819-11	METAL CHIP 680 5% 1/16W	
R334	1-216-864-11	METAL CHIP 0 5% 1/16W	
R335	1-218-847-11	METAL CHIP 1K 0.50% 1/16W	
R336	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R337	1-216-033-00	METAL CHIP 220 5% 1/10W	
R338	1-216-027-00	METAL CHIP 120 5% 1/10W	
R339	1-216-041-00	METAL CHIP 470 5% 1/10W	
R340	1-216-041-00	METAL CHIP 470 5% 1/10W	
R341	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R342	1-216-009-00	METAL CHIP 22 5% 1/10W	
R344	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R345	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R346	1-211-989-11	METAL GLAZE 68 0.50% 1/16W	
R401	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R402	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R403	1-216-857-11	METAL CHIP 1M 5% 1/16W	

Ref. No.	Part No.	Description				Remark
R404	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R405	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R406	1-218-876-11	METAL CHIP	16K	0.50%	1/16W	
R407	1-218-847-11	METAL CHIP	1K	0.50%	1/16W	
R408	1-216-864-11	METAL CHIP	0	5%	1/16W	
R409	1-216-864-11	METAL CHIP	0	5%	1/16W	
R410	1-216-864-11	METAL CHIP	0	5%	1/16W	
R411	1-216-864-11	METAL CHIP	0	5%	1/16W	
R412	1-216-811-11	METAL CHIP	150	5%	1/16W	
R413	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R414	1-216-803-11	METAL CHIP	33	5%	1/16W	
R417	1-216-864-11	METAL CHIP	0	5%	1/16W	(EVI-331V)
R501	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R502	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R503	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R504	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R505	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R506	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R507	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R508	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R509	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R510	1-216-821-11	METAL CHIP	1K	5%	1/16W	(EVI-331V)
R511	1-216-844-11	METAL CHIP	82K	5%	1/16W	(EVI-331V)
R512	1-216-864-11	METAL CHIP	0	5%	1/16W	(EVI-330V)
R513	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R514	1-216-819-11	METAL CHIP	680	5%	1/16W	
R515	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W	(EVI-331V)
R516	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R517	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R518	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R519	1-216-819-11	METAL CHIP	680	5%	1/16W	
R520	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R521	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R522	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R523	1-216-815-11	METAL CHIP	330	5%	1/16W	
R524	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R525	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R526	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R527	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R528	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R529	1-216-817-11	METAL CHIP	470	5%	1/16W	(EVI-331V)
R529	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	(EVI-330V)
R530	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R531	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R532	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R533	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R534	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R536	1-216-864-11	METAL CHIP	0	5%	1/16W	
R538	1-216-864-11	METAL CHIP	0	5%	1/16W	
		< TRANSFORMER >				
T301	1-450-976-11	TRANSFORMER, CONVERTER				
		< VIBRATOR >				
X401	1-760-320-11	VIBRATOR, CRYSTAL (EVI-330V)				
X401	1-760-321-11	VIBRATOR, CRYSTAL (EVI-331V)				
X501	1-760-081-21	VIBRATOR, CERAMIC				
**********						
		MISCELLANEOUS				
		**********				
103	1-547-735-51	FILTER BLOCK, OPTICAL				
201	8-848-704-01	DEVICE, LENS LSV-140A				
301	1-547-716-11	LENS, ZOOM (VCL-5412WA)(TYPE II)				
401	1-547-739-11	LENS, ZOOM (VCL-5412WB)(TYPE III)				
M201	1-698-364-01	MOTOR ASSY, FOCUS				
M202	1-698-363-01	MOTOR ASSY, ZOOM				
M301	3-708-888-01	METER, IG				
M302	3-708-889-01	MOTOR ASSY, FOCUS				
M303	3-708-887-01	MOTOR ASSY, ZOOM				
M401	3-708-898-01	IRIS ASSY				
M402	3-708-897-01	MOTOR ASSY, FOCUS				
M403	3-708-896-01	MOTOR ASSY, ZOOM				
W001	1-775-320-11	CABLE, FLEXIBLE FLAT (FFC-170)				
* W003	1-952-480-11	HARNESS (FK-56)				
* W004	1-952-458-12	HARNESS (VI-51)				
**********						
		ACCESSORIES & PACKING MATERIALS				
		**********				
*	1-951-473-11	HARNESS (DC-57)				
*	1-951-475-11	HARNESS (VO-50)				
*	1-952-968-12	HARNESS (IO-64)				
	3-964-918-11	CARTON, OUTER				

4. SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM





EVI-330V ;NTSC

EVI-331V ;PAL

SPECIFICATIONS ARE SUBJECT TO CHANGE WITH OUT NOTICE.

FUNCTION

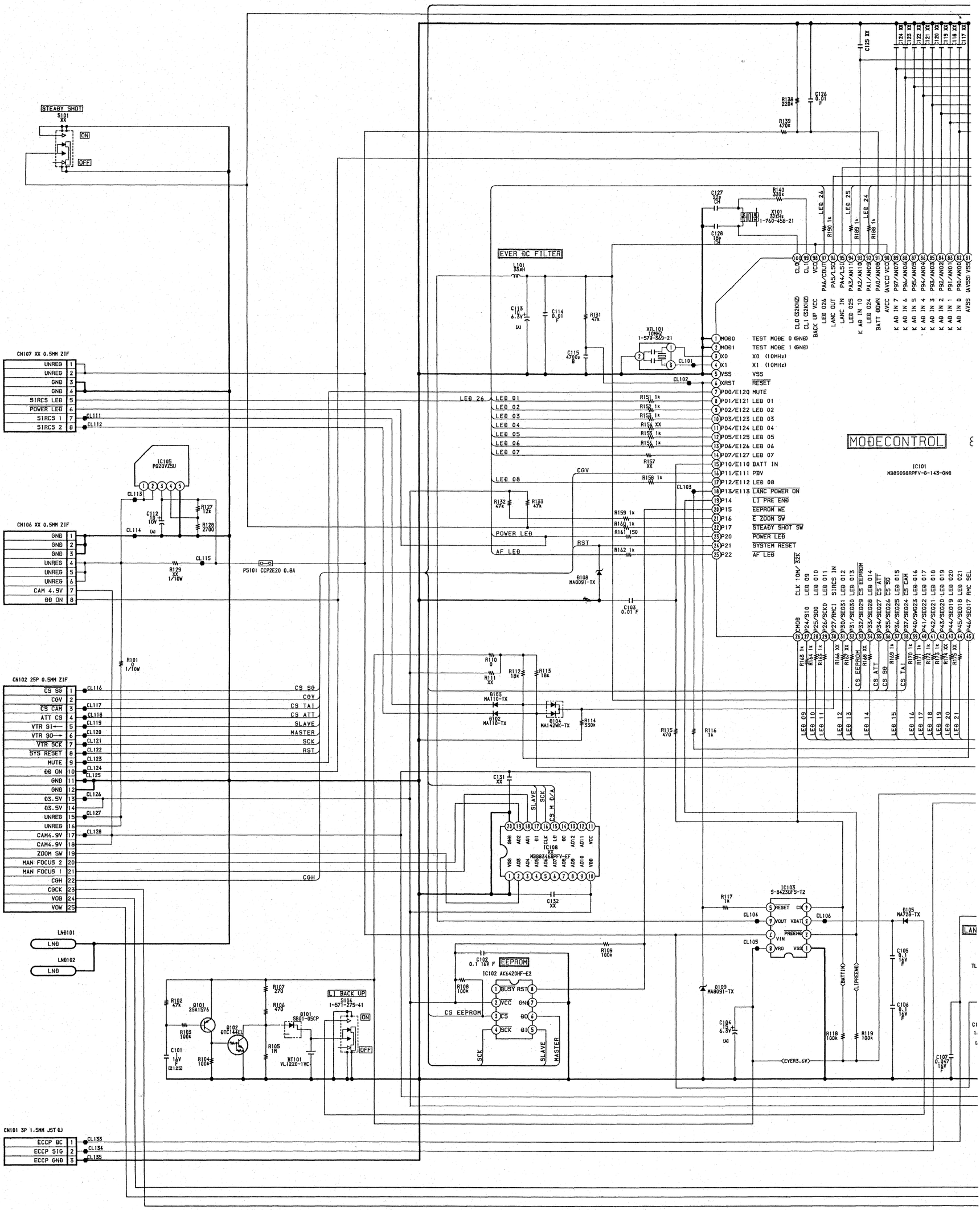
CTOR CABLE

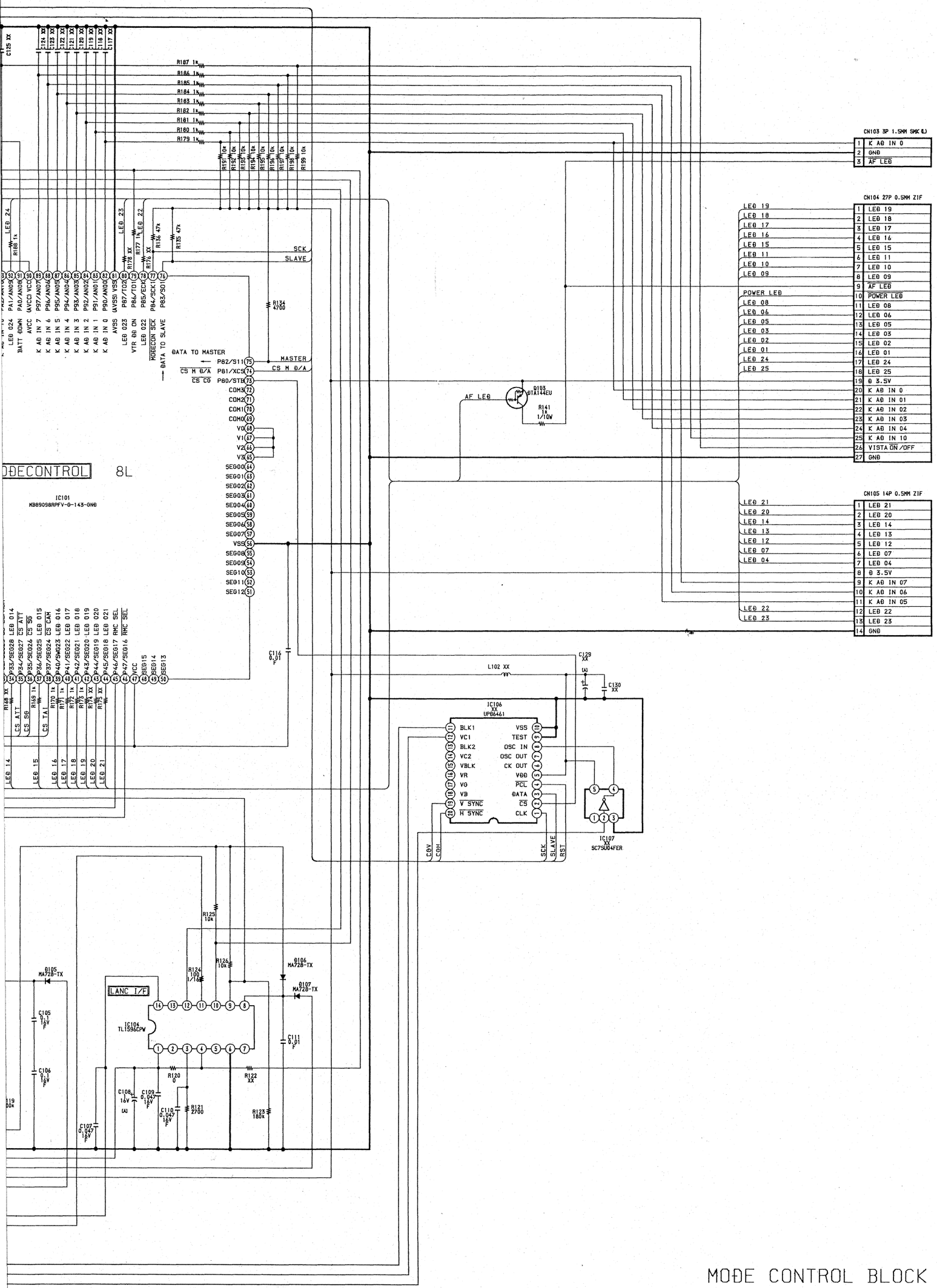
ACCESSORY)

EVI-330V/-331V

FRAME SCHEMATIC ÐIAGRAM

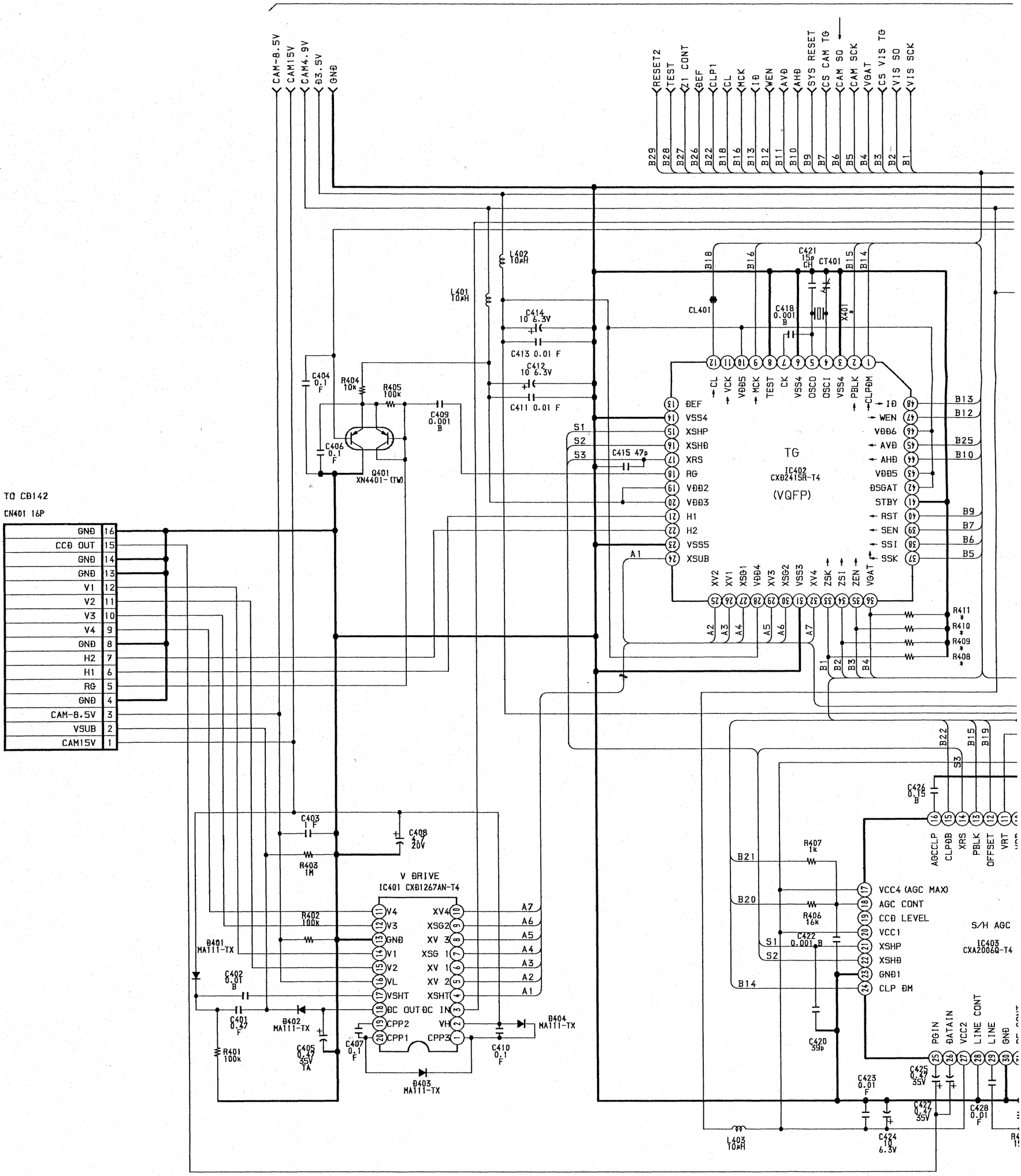
4-2. MD-61 (MODE CONTROL BLOCK) SCHEMATIC DIAGRAM





MODE CONTROL BLOCK

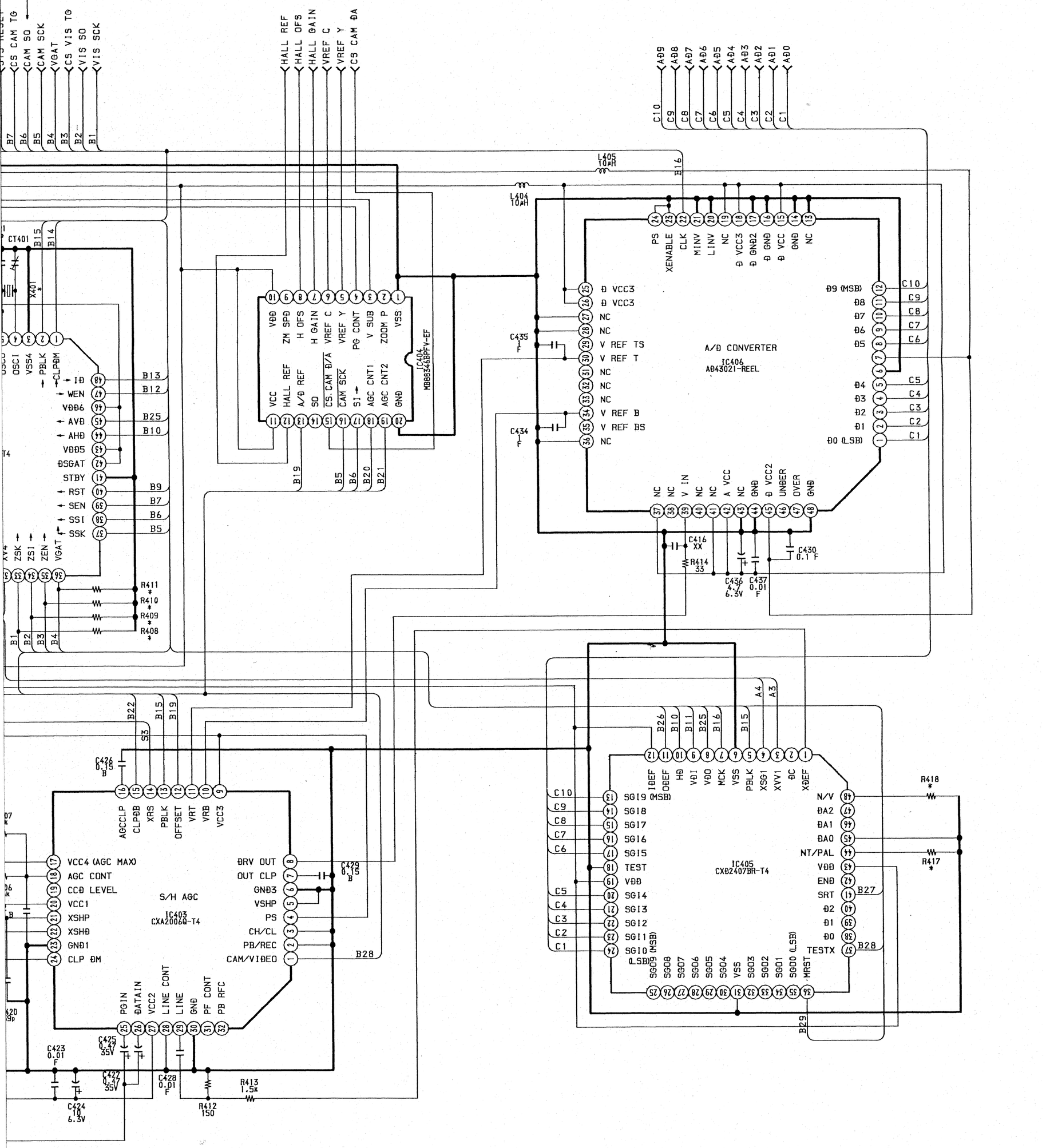
4-3. VC-170 (1/4) (CAMERA 1 BLOCK) SCHEMATIC DIAGRAM



EVI-330V	EVI-331V
X401A 28.6363MHz	X401B 28.375MHz
R417A XX	R417B 0
R418A XX	R418B XX

EVI-330V	EVI-331V
R408A 0	R408B 0
R409A 0	R409B 0
R410A 0	R410B 0
R411A 0	R411B 0

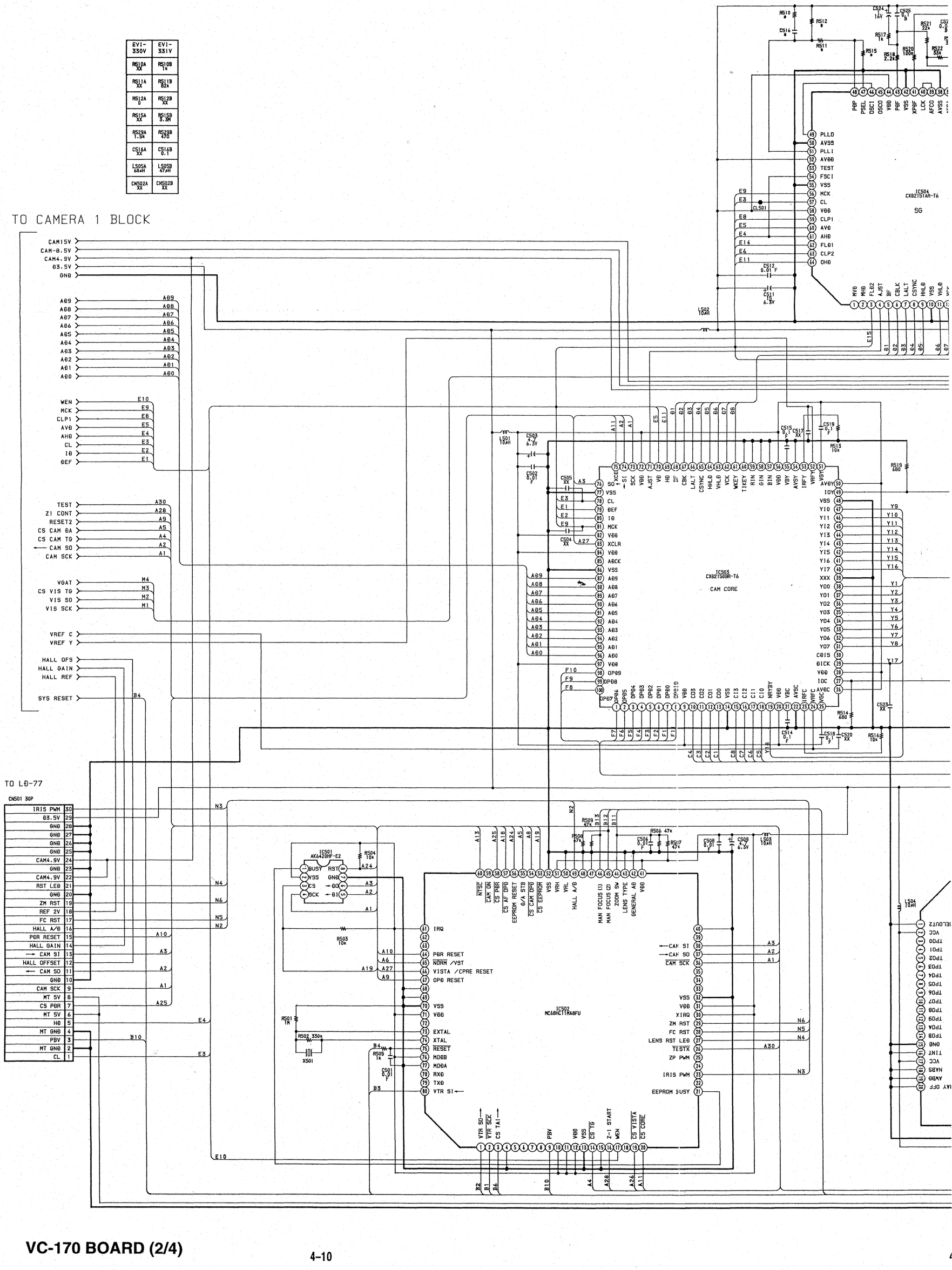
TO CAMERA 2 BLOCK


CS CAM TG
CAM SO
CAM SCK
VGAT
CS VIS TG
VIS SO
VIS SCK
HALL REF
HALL OFS
HALL GAIN
VREF C
VREF Y
CS CAM ÐA
AÐ9
AÐ8
AÐ7
AÐ6
AÐ5
AÐ4
AÐ3
AÐ2
AÐ1
AÐ0
L405 10µH
L404 10µH
IC404 MB88346BPFV-EF
VÐÐ ZM SPÐ H OFS H GAIN VREF C VREF Y PG CONT V SUB ZOOM P VSS
VCC HALL REF A/Ð REF SO CS.CAM Ð/A CAM SCK SI AGC CNT1 AGC CNT2 GNÐ
IC406 AÐ43021-REEL
A/Ð CONVERTER
PS XENABLE CLK MINV LINV NC Ð VCC3 Ð GNÐ2 Ð GNÐ Ð VCC GNÐ NC
Ð VCC3 Ð VCC3 NC NC V REF TS V REF T NC NC NC V REF B V REF BS NC
Ð9 (MSB) Ð8 Ð7 Ð6 Ð5 Ð4 Ð3 Ð2 Ð1 Ð0 (LSB)
NC NC V IN NC NC A VCC NC GNÐ Ð VCC2 UNÐER OVER GNÐ
C435 F
C434 F
C416 XX
R414 33
C436 4.7 6.3V
C437 0.01 F
C430 0.1 F
CT401
X401
OSCI VSS4 PBLK CLPÐM IÐ WEN VÐÐ6 AVÐ AHÐ VÐÐ5 ÐSGAT STBY RST SEN SSI SSK
ZSK ZSI ZEN VGAT
R411 R410 R409 R408
C426 0.15 B
AGCCLP CLPÐB XRS PBLK OFFSET VRT VRB VCC3
S/H AGC IC403 CXA2006Q-T4
VCC4 (AGC MAX) AGC CONT CCÐ LEVEL VCC1 XSHP XSHÐ GNÐ1 CLP ÐM
ÐRV OUT OUT CLP GNÐ3 VSHP PS CH/CL PB/REC CAM/VIÐEO
C429 0.15 B
PGIN ÐATAIN VCC2 LINE CONT LINE GNÐ PF CONT PB RFC
C425 0.47 35V
C423 0.01 F
C427 0.47 35V
C428 0.01 F
C424 10 6.3V
R413 1.5k
R412 150
IC405 CXÐ2407BR-T4
IÐEF OÐEF HÐ VÐI VÐO MCK VSS PBLK XSG1 XVV1 ÐC XÐEF
SGI9 (MSB) SGI8 SGI7 SGI6 SGI5 TEST VÐÐ SGI4 SGI3 SGI2 SGI1 SGI0 (LSB)
SGO9 (MSB) SGO8 SGO7 SGO6 SGO5 SGO4 VSS SGO3 SGO2 SGO1 SGO0 (LSB) MRST
N/V ÐA2 ÐA1 ÐA0 NT/PAL VÐÐ ENÐ SRT Ð2 Ð1 Ð0 TESTX
R418 R417
B1 B2 B3 B4 B5 B6 B7 B10 B12 B13 B15 B16 B19 B20 B21 B22 B25 B26 B27 B28 B29
A3 A4
S3

CAMERA 1 BLOCK

4-3. VC-170 (2/4) (CAMERA 2 BLOCK) SCHEMATIC DIAGRAM

EVI-330V	EVI-331V
R510A XX	R510B 1K
R511A XX	R511B 82K
R512A 0	R512B XX
R515A XX	R515B 3.3M
R529A 1.5K	R529B 470
C516A XX	C516B 0.1
L505A 68uH	L505B 47uH
CN502A XX	CN502B XX



CAMERA 2 BLOCK

TO ØØ BLOCK

TO BUFFER BLOCK

TO STEAØY BLOCK

CN504 25P 0.5MM ZIF

1	CS SG
2	CGV
3	CS CAM
4	ATT CS
5	VTR SI
6	VTR SO
7	VTR SCK
8	SYS RESET
9	MUTE
10	ØØ ON
11	GNØ
12	GNØ
13	Ø3.5V
14	Ø3.5V
15	UNREG
16	UNREG
17	CAM4.9V
18	CAM4.9V
19	ZOOM SW
20	MAN FOCUS2
21	MAN FOCUS1
22	CGH
23	CGCK
24	VOB
25	VOW

CN502 *

1	Ø3.5V
2	NRYBY
3	Ø3.5V
4	C3
5	GNØ
6	C2
7	VTR SCK
8	C1
9	VTR SI
10	C0
11	VTR SO
12	ØICK
13	GNØ
14	Y7
15	GNØ
16	Y6
17	AHØ
18	Y5
19	AVØ
20	Y4
21	CGV
22	Y3
23	FRAME P
24	Y2
25	ATT RESET
26	Y1
27	ATT CS
28	Y0
29	GNØ
30	GNØ

IC504 CXØ215TAR-T6 SG

IC505 CXØ2133ØR-T6 OPØ

FL501 1-239-352-21

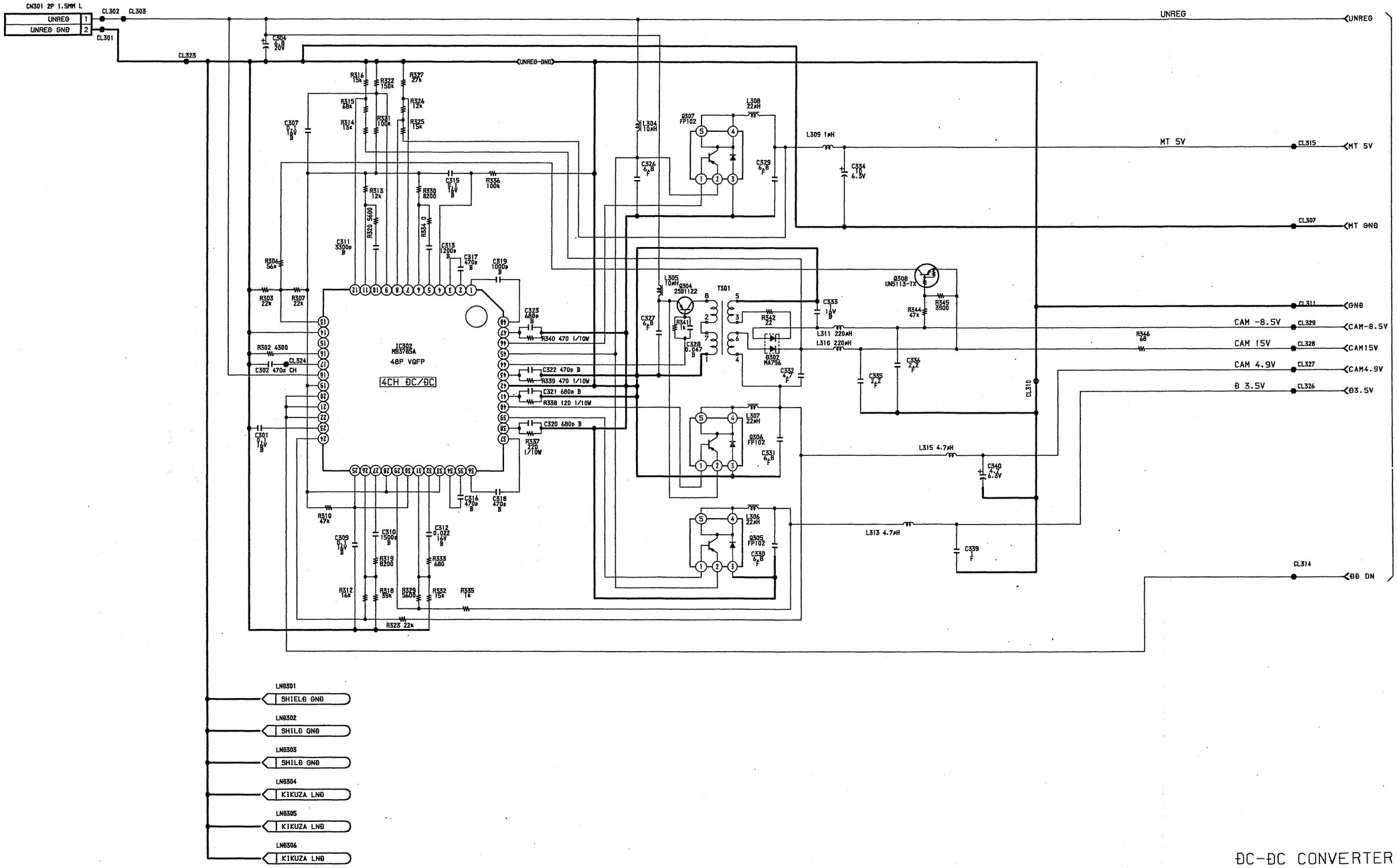
Q501 2SB1218A-QRS-TX

Q502 2SB1218A-QRS-TX

Q503 2SØ1819A-QRS-TX

Q504 2SB1218A-QRS-TX

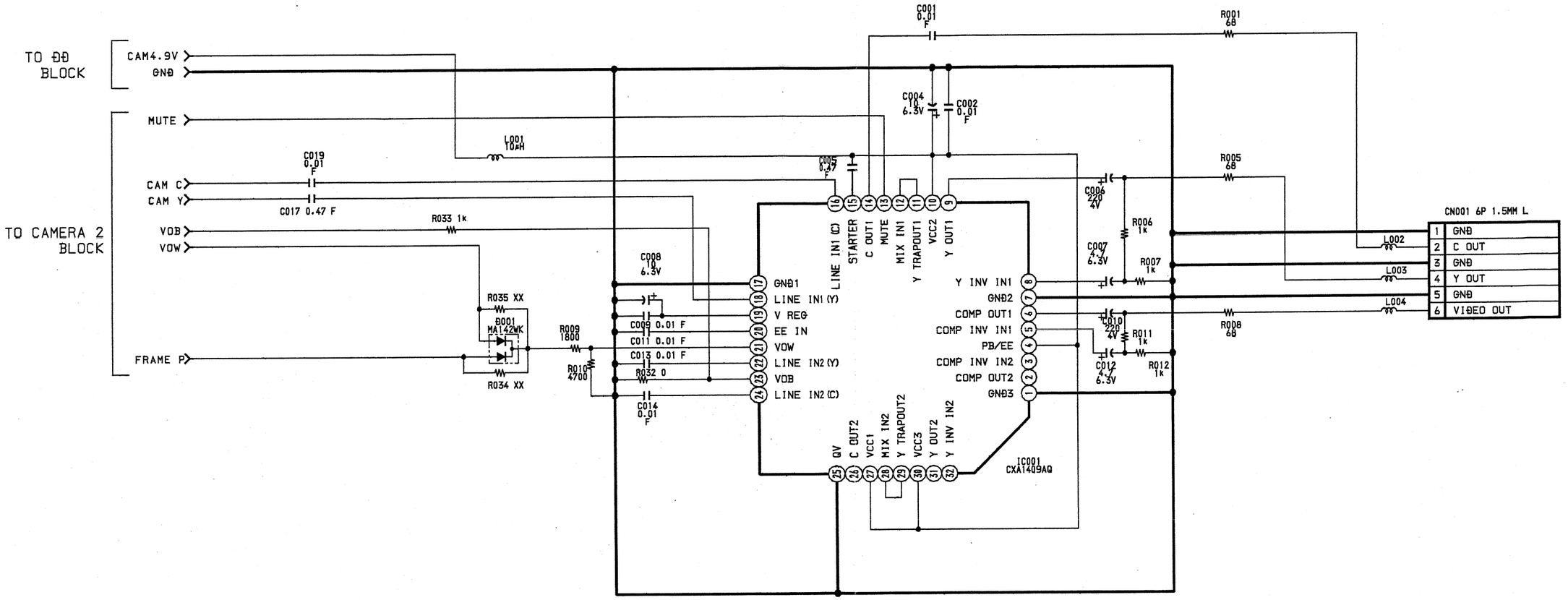
4-3. VC-170 (3/4) (DC-DC CONVERTER BLOCK) SCHEMATIC DIAGRAM



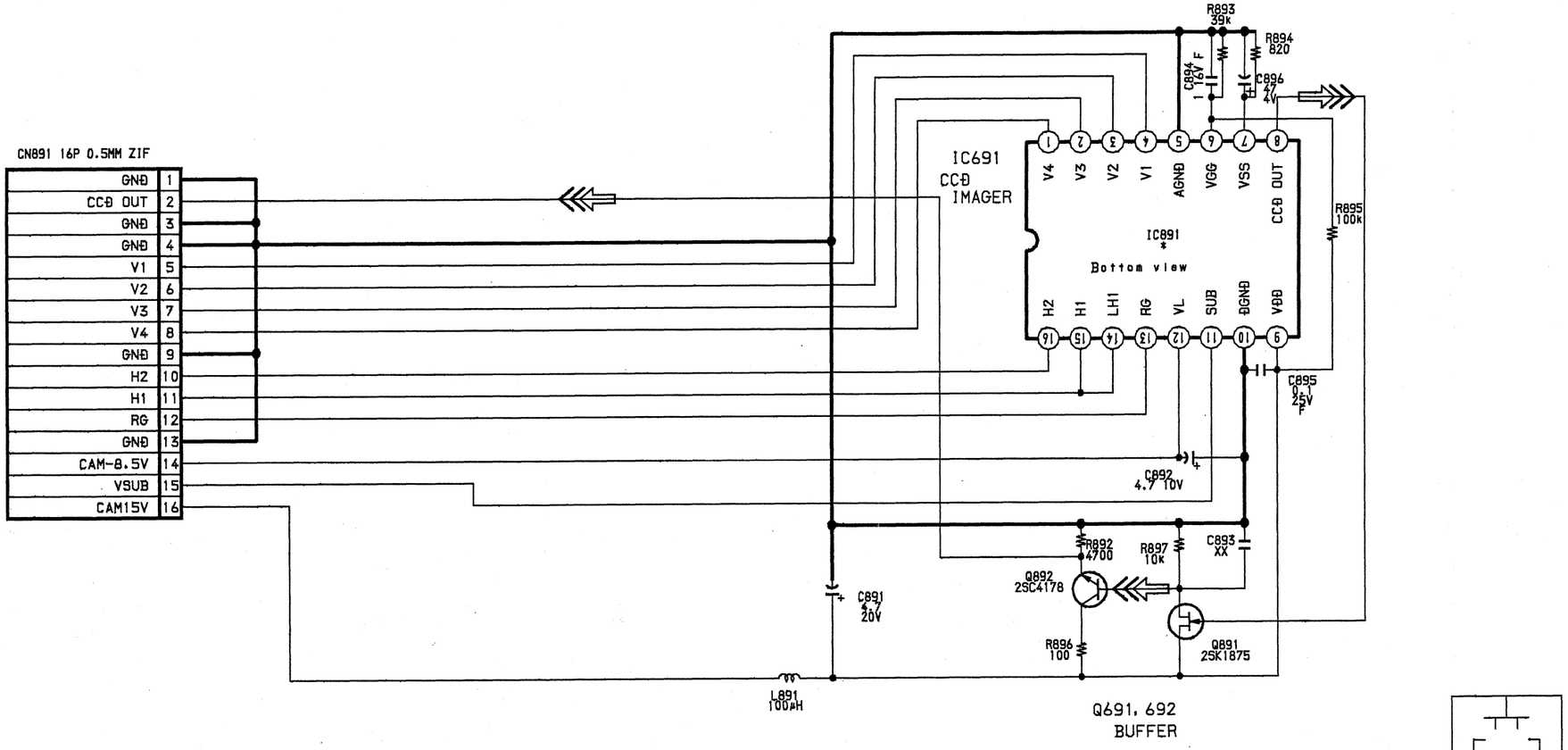
DC-DC CONVERTER BLOCK

VC-170 BOARD (3/4)

4-3. VC-170 (4/4) (COMPOSIT VIDEO/S VIDEO BUFFER BLOCK) SCHEMATIC DIAGRAM



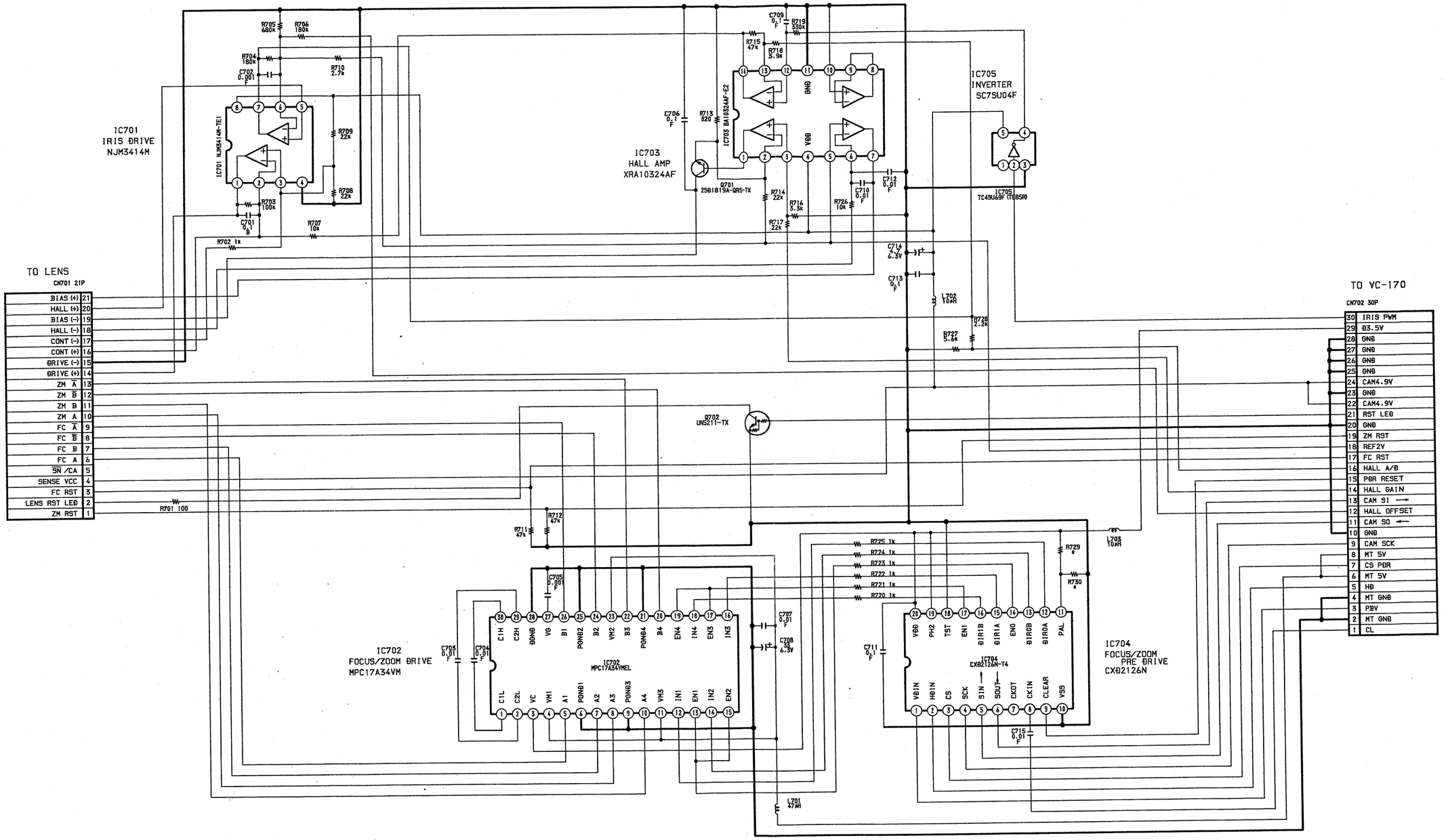
COMPOSITE VIĐEO/S VIĐEO BUFFER BLOCK



EVI-330V	EVI-331V
IC891A ICX058AK-11	IC891B ICX059AK-11

CCD IMAGER BLOCK

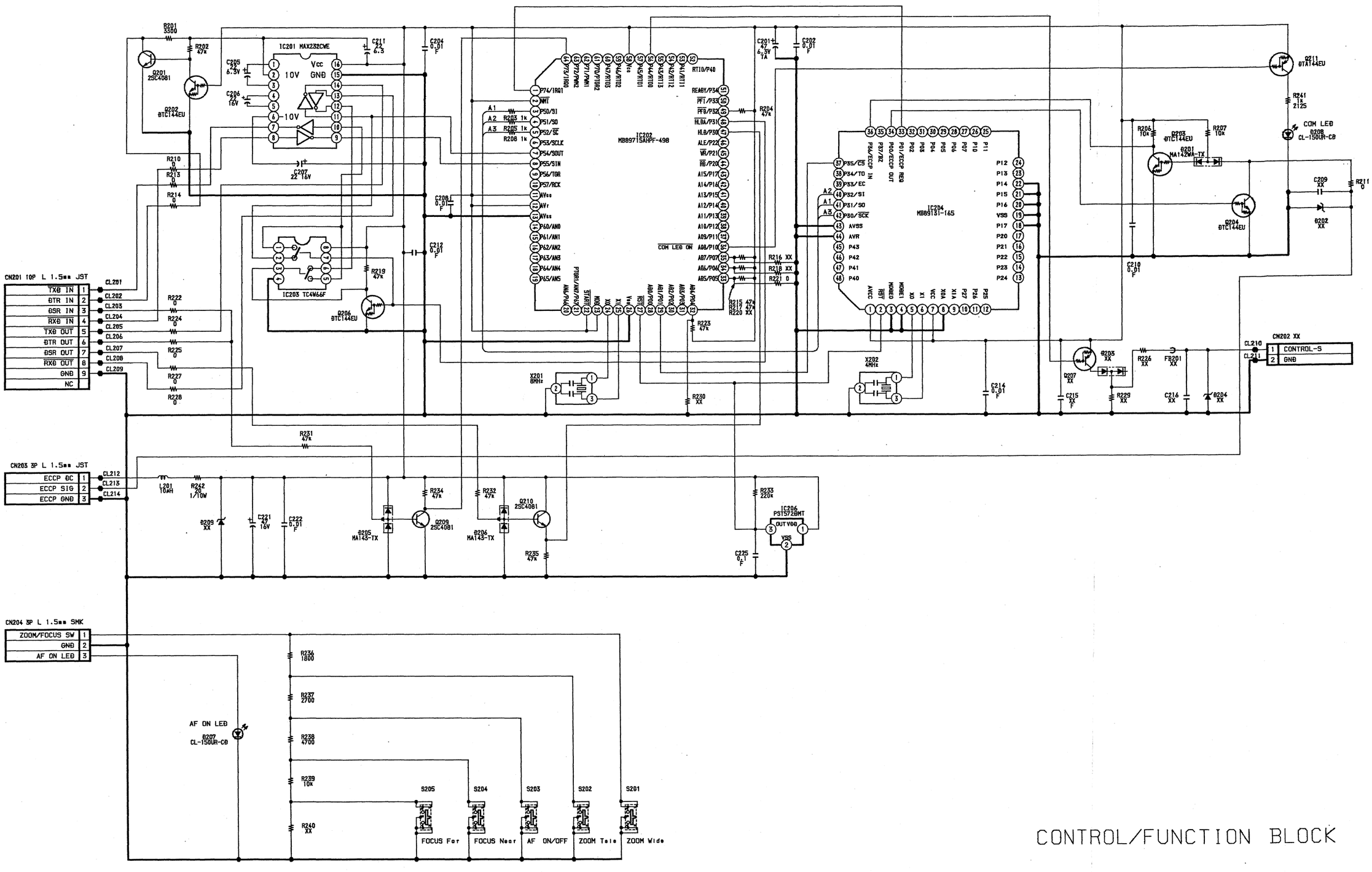
4-5. LD-77 (LENS DRIVER BLOCK) SCHEMATIC DIAGRAM



EVI-330V	EVI-331V
R729A XX	R729B 0
R730A 0	R730B XX

LENS DRIVER BLOCK

4-6. IF-51 (CONTROL/FUNCTION) SCHEMATIC DIAGRAM

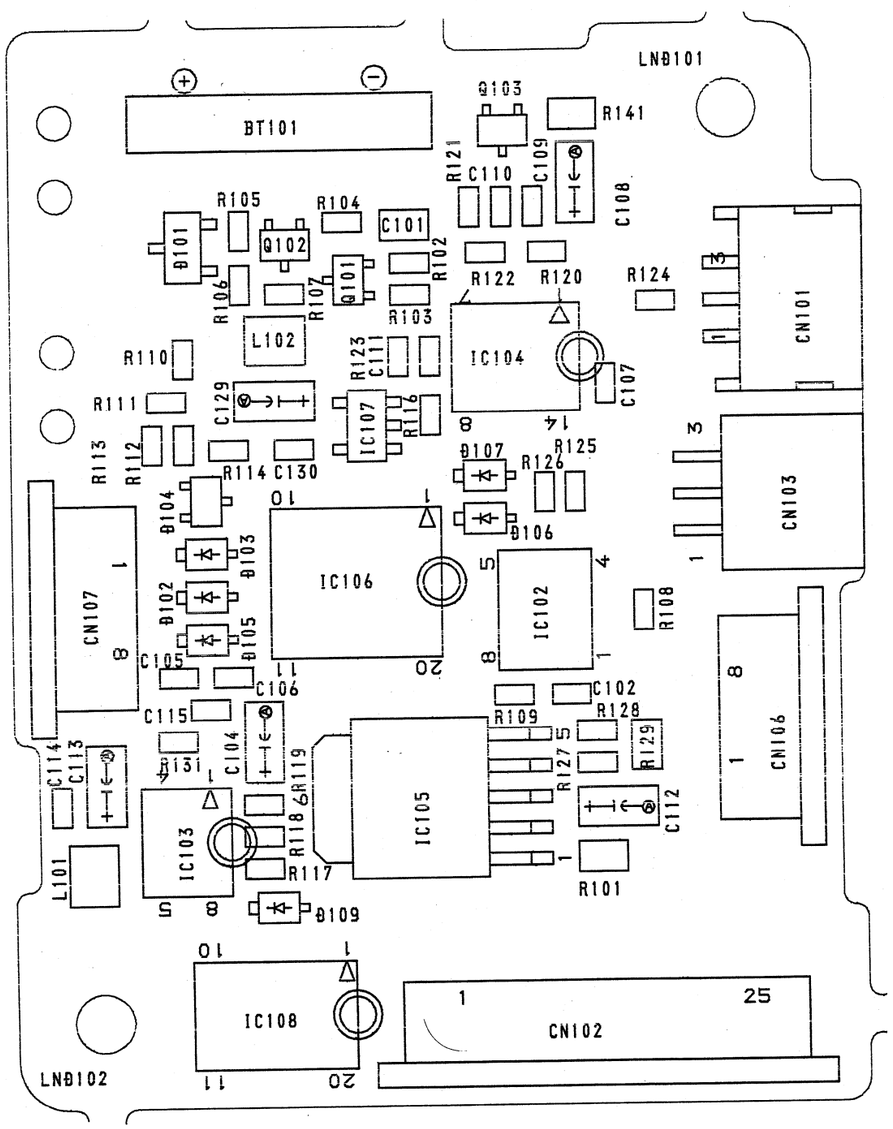


CONTROL/FUNCTION BLOCK

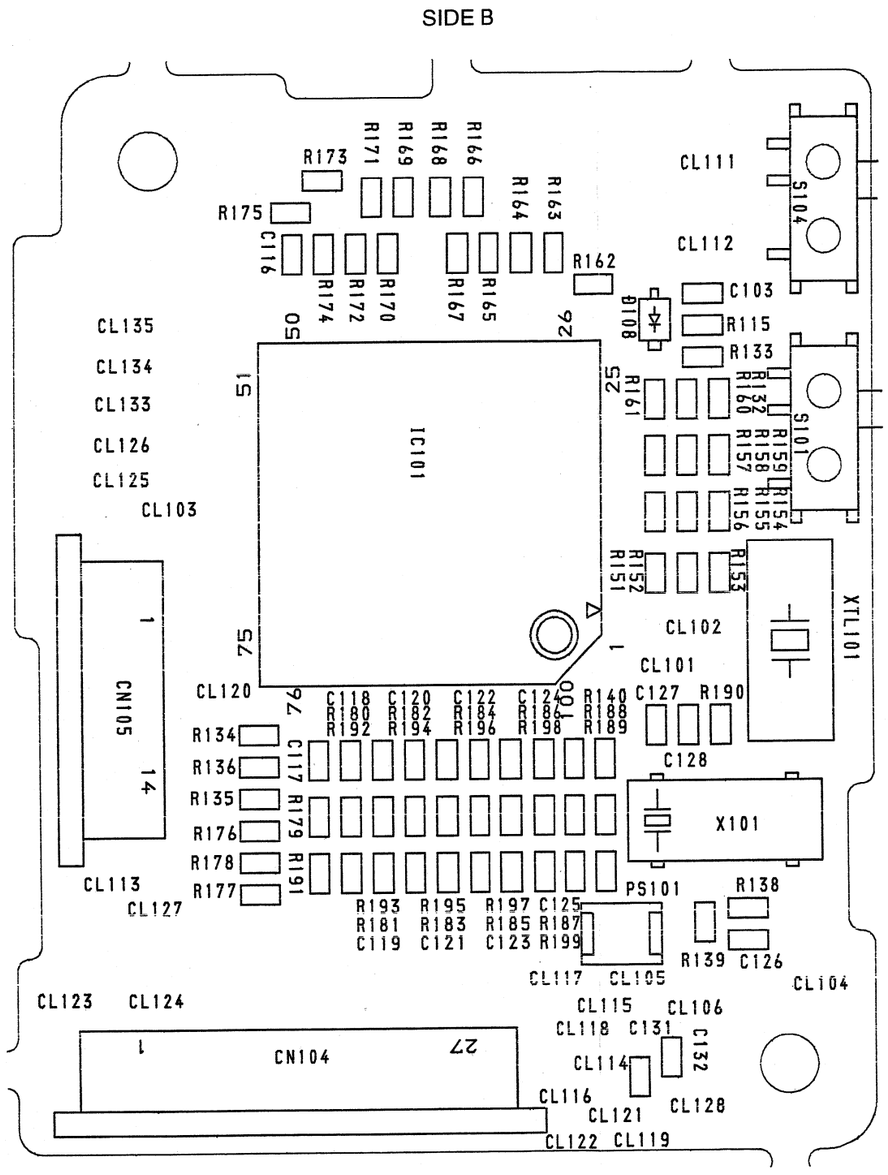
5. PWB MOUNTING DIAGRAMS

5-1. MD-61 PWB Mounting Diagram

SIDE A

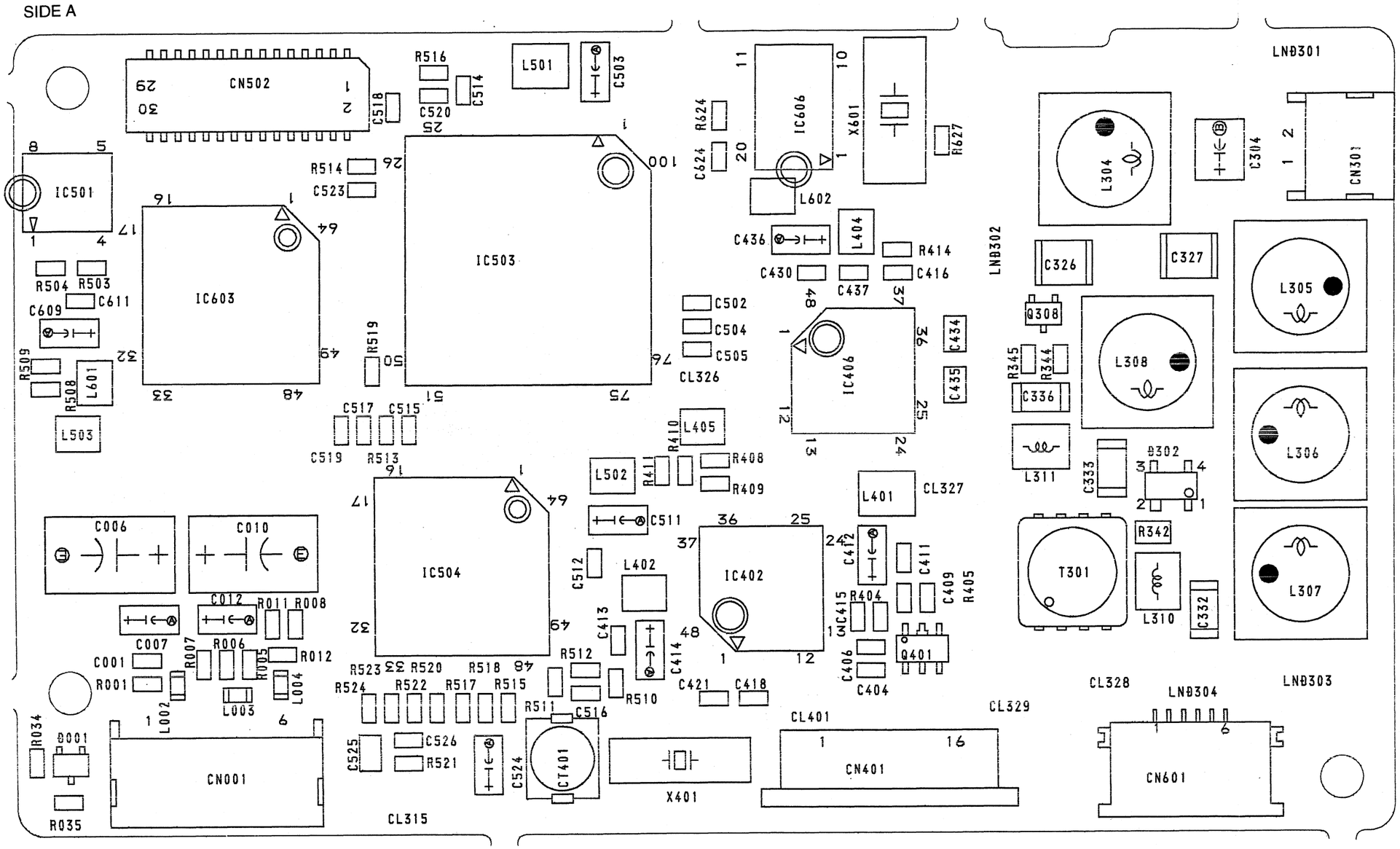


SIDE B



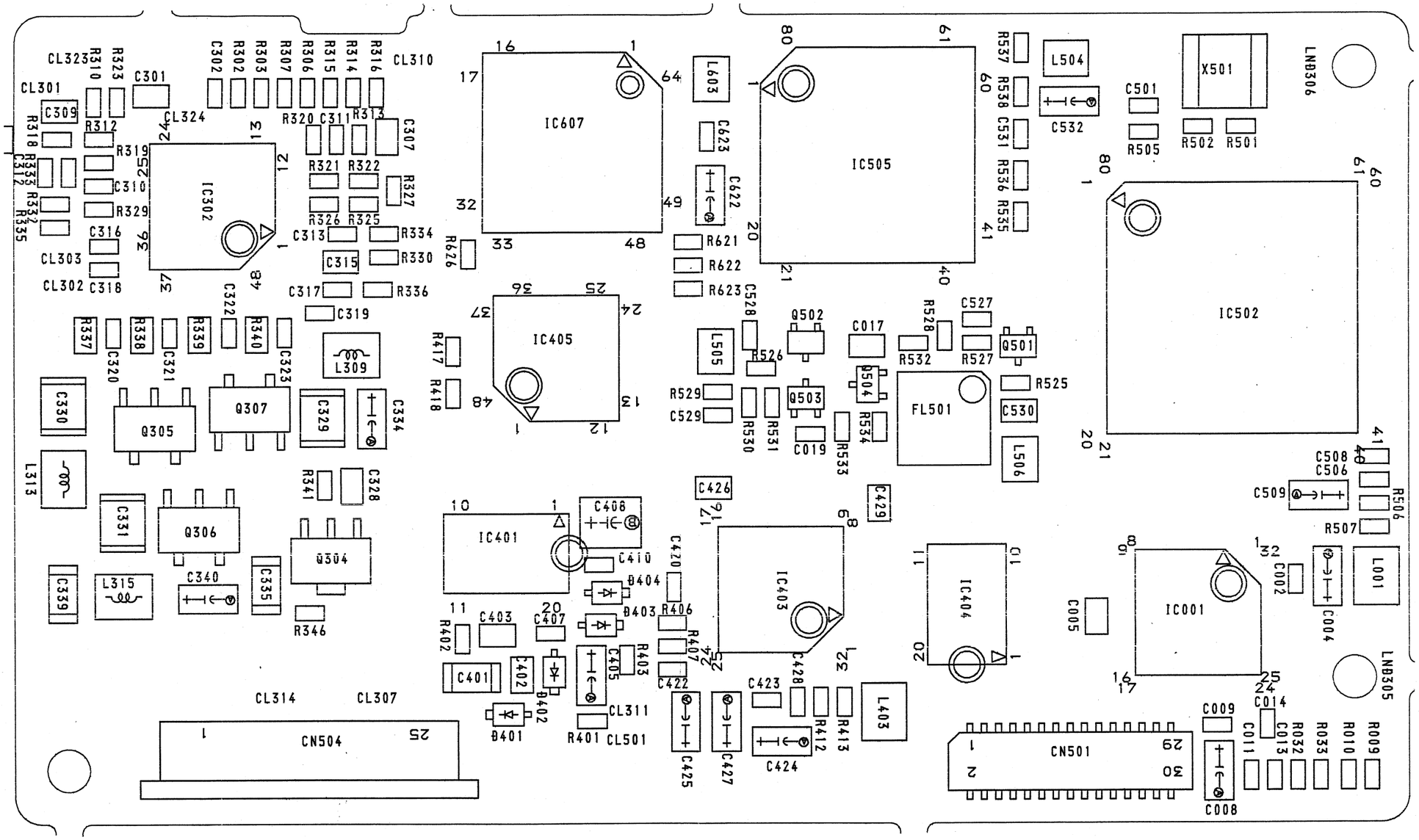
MD-61 BOARD

5-2. VC-170 PWB Mounting Diagram



EVI-330V NTSC	EVI-331V PAL
X401A 28.6363MHz	X401B 28.375MHz
R510A NO M't	R510B 1k
R511A NO M't	R511B 82k
R512A 0	R512B NO M't
R515A NO M't	R515B 3.3M
C516A NO M't	C516B 0.1

SIDE B


IC607
IC505
IC502
IC302
IC405
IC401
IC403
IC404
IC001
FL501
X501
LNB306
LNB305
CN504
CN501
Q305
Q306
Q307
Q304
Q501
Q502
Q503
Q504
L309
L315
L313
L603
L504
L505
L506
L403
L001
C532
C530
C528
C527
C526
C529
C017
C019
C533
C534
C501
C505
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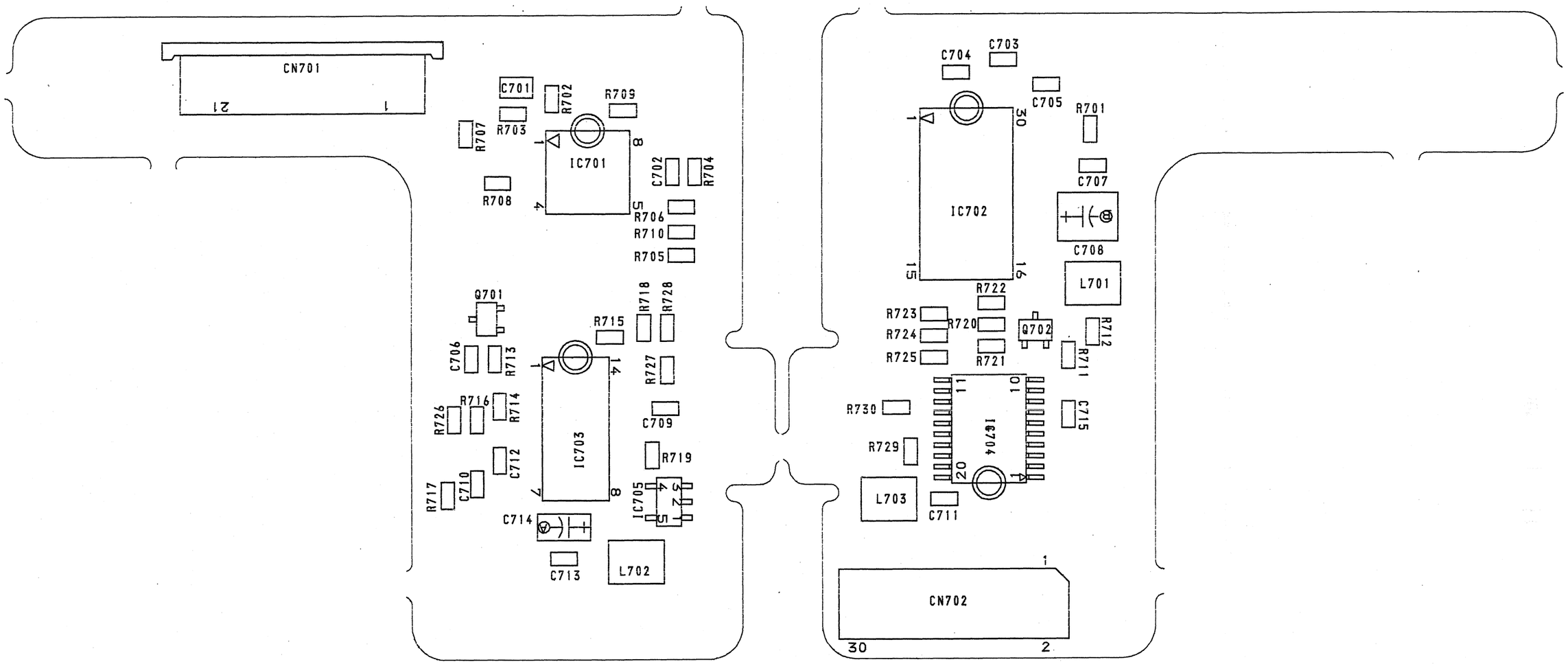
C579

5-4. LD-77 PWB Mounting Diagram

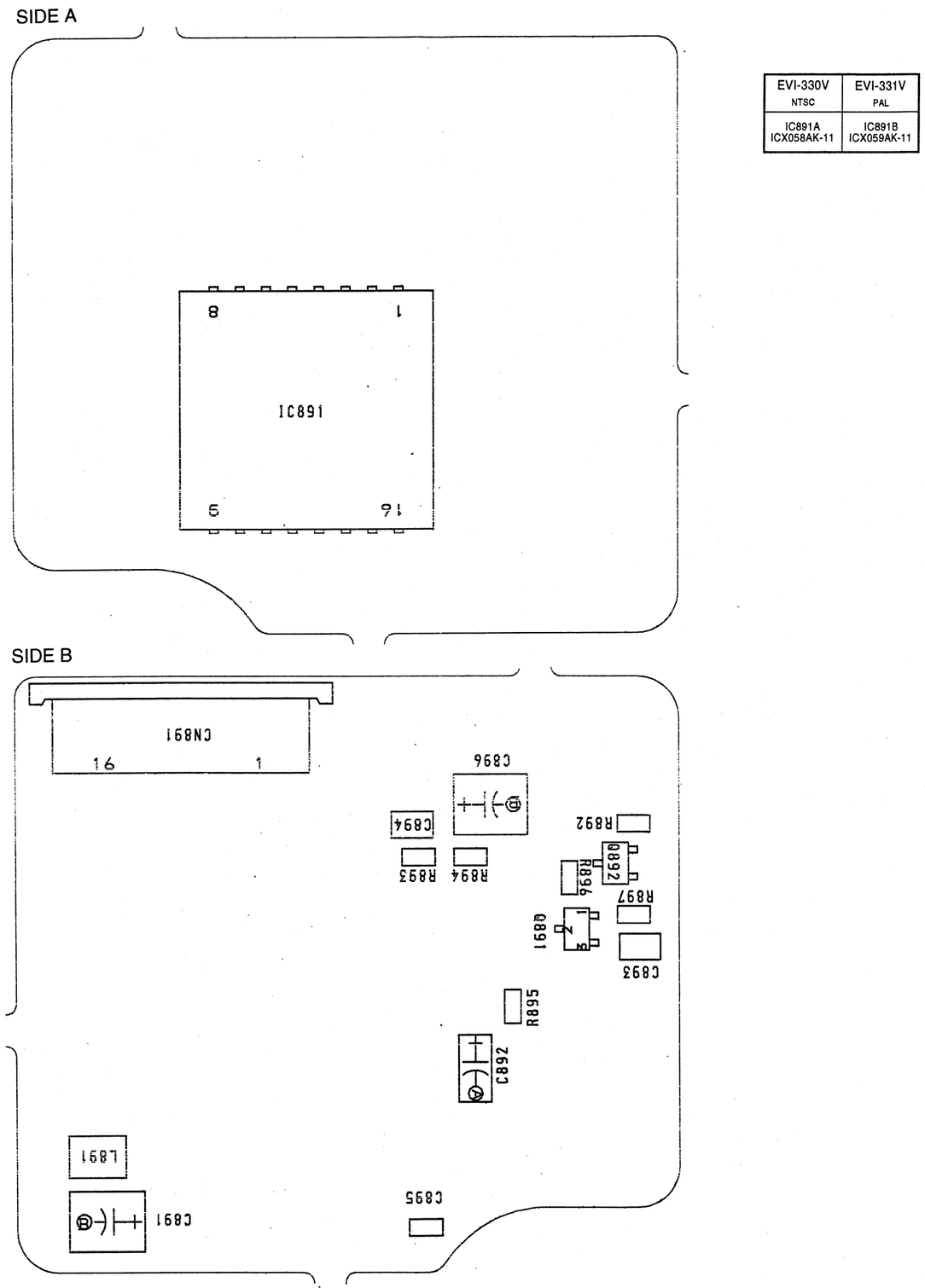
SIDE A

SIDE B



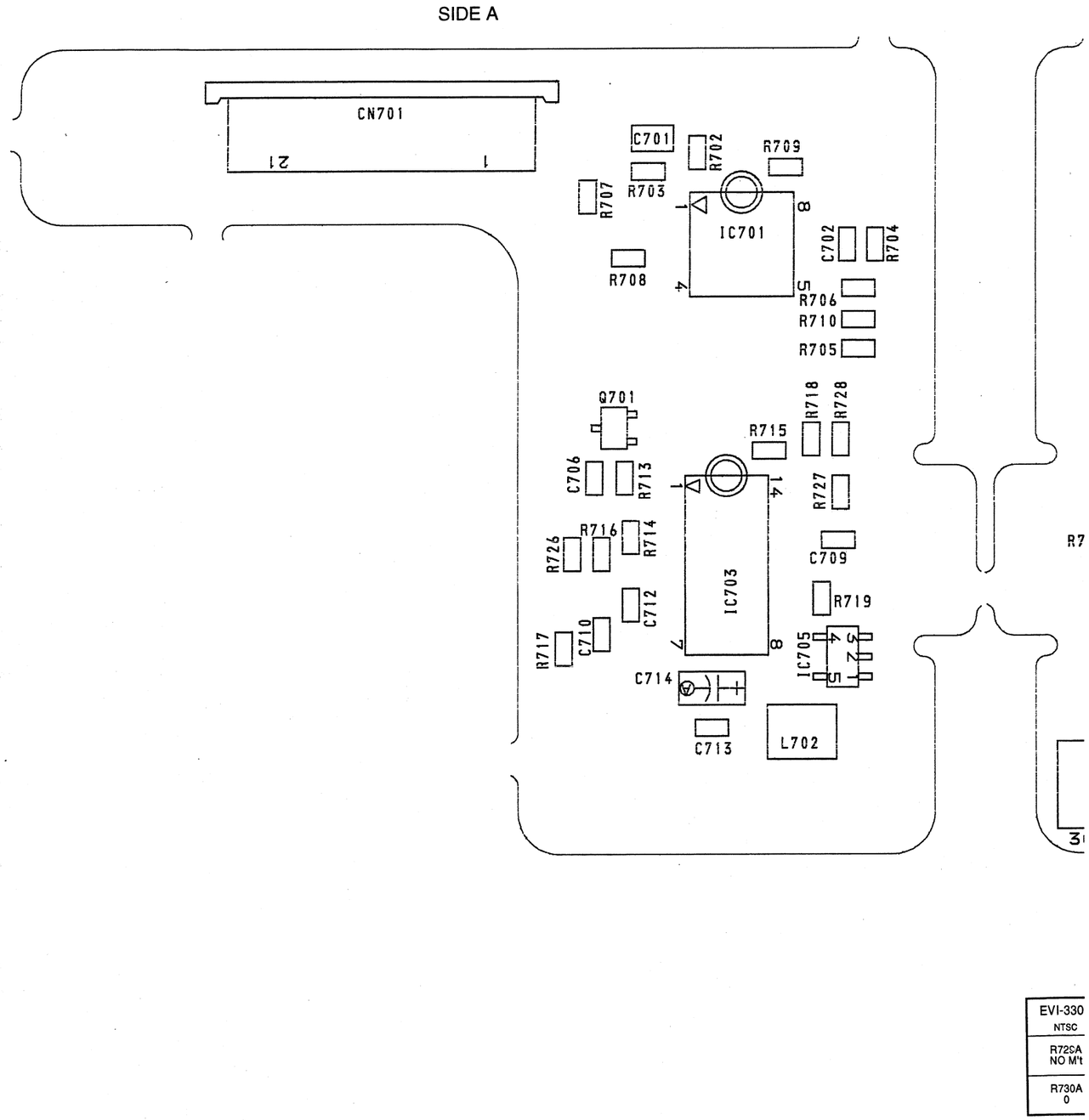
EVI-330V NTSC	EVI-331V PAL
R729A NO M't	R729B 0
R730A 0	R730B NO M't

5-3. CD-142 PWB Mounting Diagram



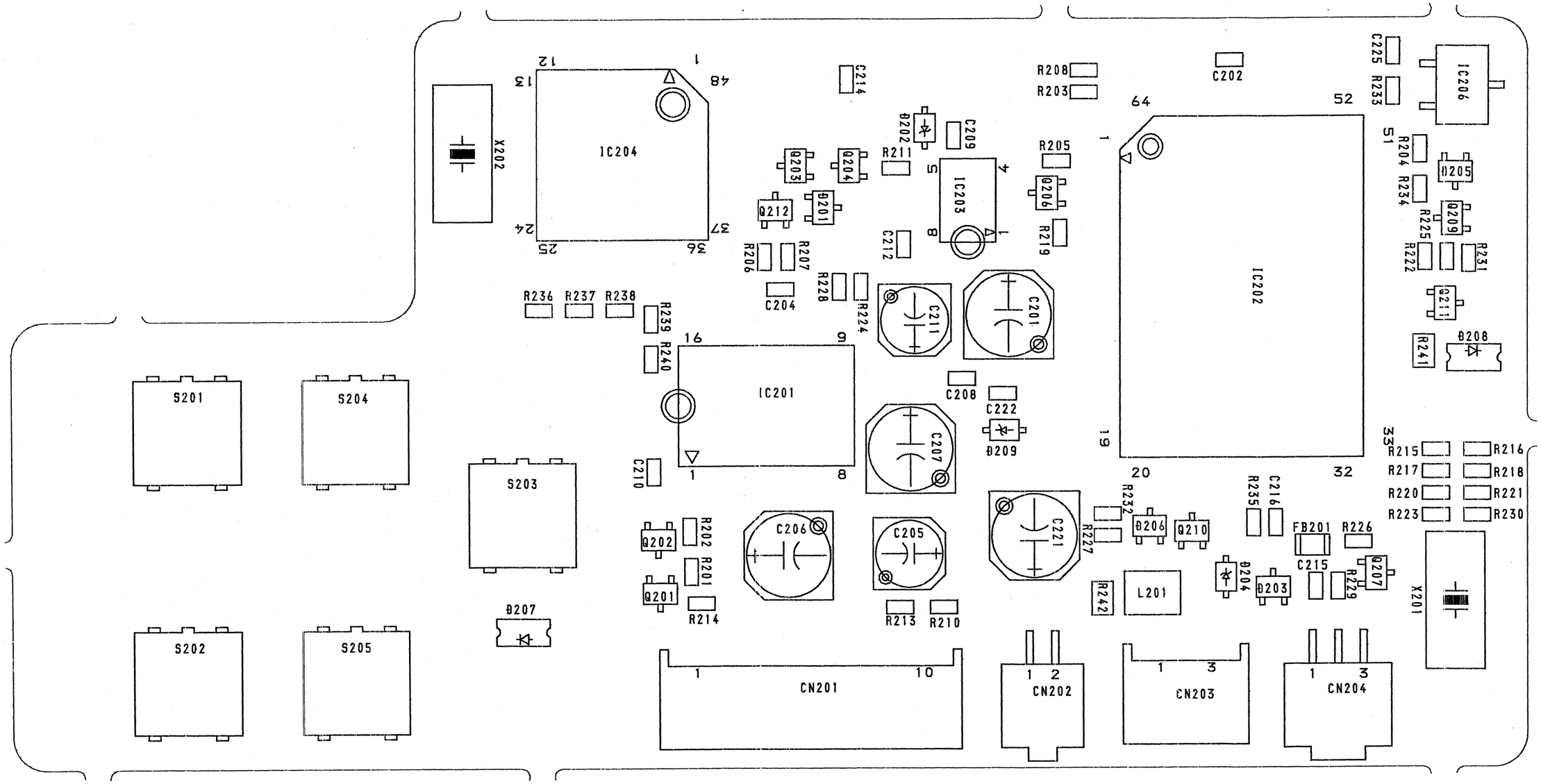
EVI-330V NTSC	EVI-331V PAL
IC891A ICX058AK-11	IC891B ICX059AK-11

5-4. LD-77 PWB Mounting Diagram



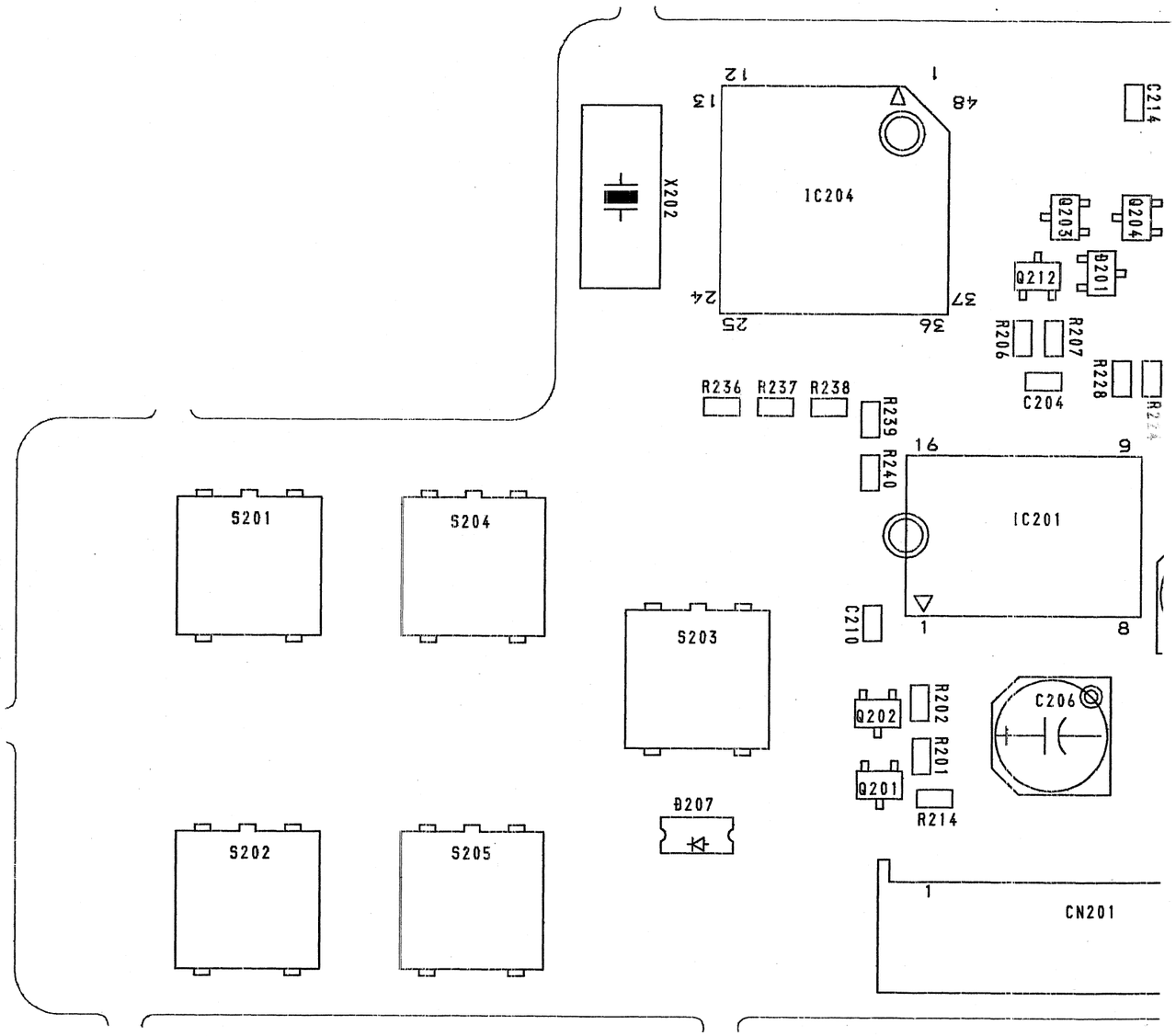
EVI-330 NTSC
R728A NO M't
R730A 0

5-5. IF-51 PWB Mounting Diagram



IF-51 BOARD

5-5. IF-51 PWB Mounting Diagram



IF-51 BOARD

6. LIST OF SERVICE TOOLS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from next page.

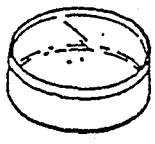
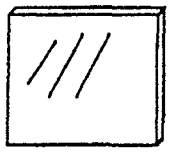
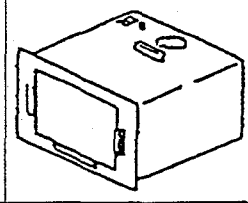
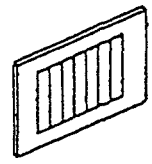
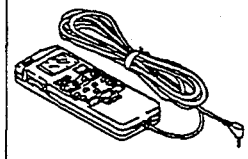
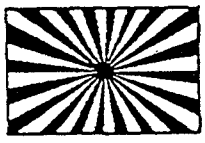
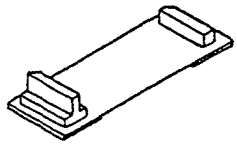
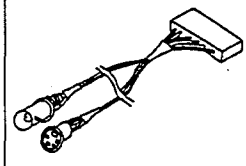
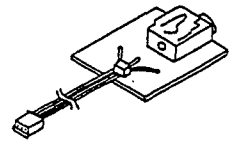
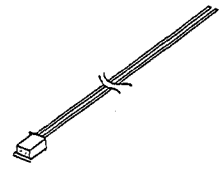
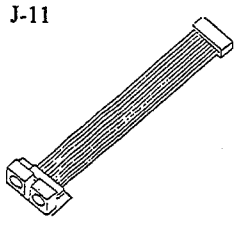
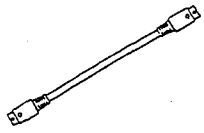
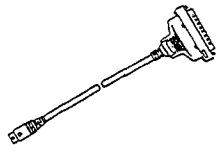
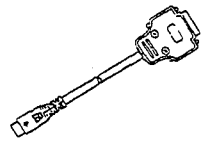
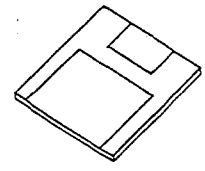
PREPARATIONS BEFORE ADJUSTMENT

List of Service Tools

- Oscilloscope
- Regulated power supply
- Vectorscope
- Adjusting driver
- Color monitor
- Digital voltmeter

Ref. No.	Ref. No.	Parts Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	White balance check
	ND filter 0.3	J-6080-818-A	White balance check
J-3	Pattern box PTB-450	J-6082-200-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote commander Note 1 (RM-95-remodeled partly)	J-6082-053-B	
J-6	Siemens star	J-6080-875-A	For checking the flange back
J-7	Extension cable (30P, 0.8mm)	J-6082-189-A	For extension between the LD-62 board (CN752) and VC-128 board (CN652)
J-8	Video/S video out cable	J-6082-293-A	For checking the video signal
J-9	Extension cable 3	J-6082-291-A	For adjusting remote commander (J-5)
J-10	DC-57 harness (2P)	1-951-473-11	For DC-supply to VC-128/128P (CN351)
J-11	RS-61 board	J-6082-295-A	For connection between IF-51 board (CN201) & RS-232C cable
J-12	RS-232C cable (8P DIN-8P DIN)	1-590-879-11	For connection between RS-61 board & MACINTOSH
J-13	RS-232C cable (8P DIN-25P DSUB)	1-751-195-11 SMF-532A (79-6363-00)	For connection between RS-61 board & NEC PC98
J-14	RS-232C cable (8P DIN-9P DSUB female)	1-690-391-21 SMF-533 (48-5233-00)	For connection between RS-61 board & IBM PC,QUARTER-L
J-15	IF-51 VISCA Control Software	J-6082-297-A	For IBM PC/NEC PC98
		J-6082-296-A	For MACINTOSH

Note 1: If the processor IC in the adjusting remote commander is not the new microprocessor (UPD7503G-C56-12), the pages cannot be switched. In this case, replace with the new micro processor (8-759-148-35).

J-1 	J-2 	J-3 	J-4 	J-5 
J-6 	J-7 	J-8 	J-9 	J-10 
J-11 	J-12 	J-13 	J-14 	J-15 

7. ADJUSTMENTS

7-1-1. Preparations

Note: When adjusting only, the lens block and VC-170 board need not be taken apart.

1) Connect the equipments for adjusting as shown in Fig. 7-2.
2) Turning OFF the Auto Focus Using the Adjusting Remote Commander
   1. Set data: 01 to page: 6, address: 25.
      (The auto focus will turn OFF. The focus can be adjusted using the focus button on the adjusting remote commander. But the HOLD switch must be set to OFF.)
   2. After completing the adjustment/operation check, set data: 00 to page: 6, address: 25.
3) Turning OFF the STEADY SHOT Function Using the Adjusting Remote Commander (EVI-330T/331T)
   1. Set data: 02 to page: 6, address: 32.
   2. Set data: 01 to page: 6, address: 33.
      (The STEADY SHOT will go OFF.)
   3. After completing the adjustment/operation check, return the data of address: 32 and address: 33 of page: 6 to 00.

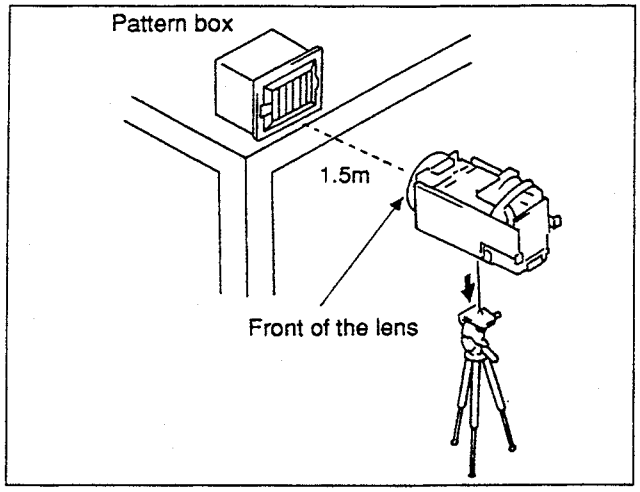


Fig. 7-1.

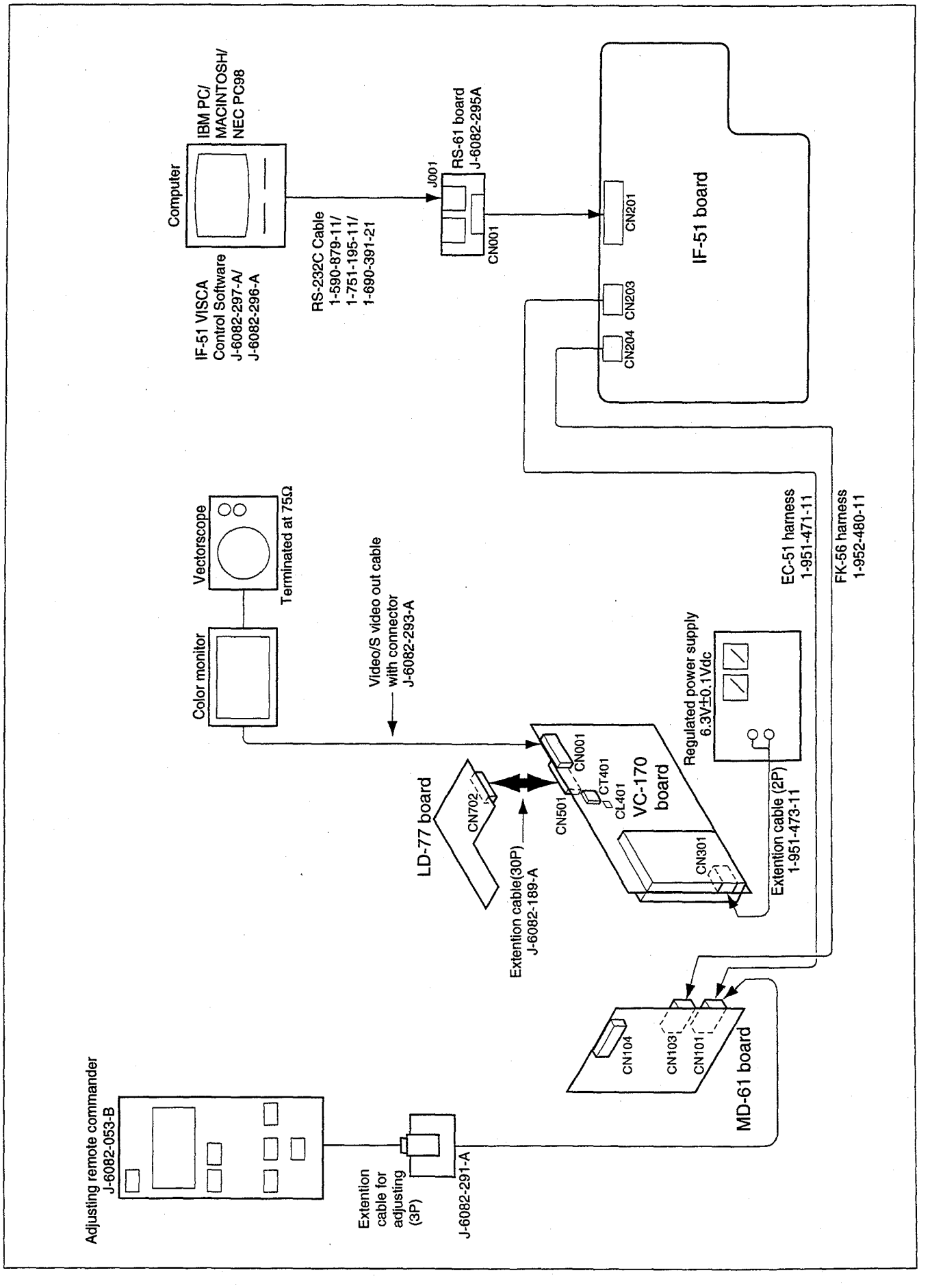

Computer
IBM PC/
MACINTOSH/
NEC PC98
IF-51 VISCA
Control Software
J-6082-297-A/
J-6082-296-A
RS-232C Cable
1-590-879-11/
1-751-195-11/
1-690-391-21
J001
RS-61 board
J-6082-295A
CN001
CN201
IF-51 board
CN203
CN204
Vectorscope
Terminated at 75Ω
Color monitor
Video/S video out cable
with connector
J-6082-293-A
EC-51 harness
1-951-471-11
FK-56 harness
1-952-480-11
Regulated power supply
6.3V±0.1Vdc
CN001
CT401
CL401
VC-170
board
CN501
CN301
LD-77 board
CN702
Extention cable(30P)
J-6082-189-A
Extention cable (2P)
1-951-473-11
CN104
CN103
CN101
MD-61 board
Adjusting remote commander
J-6082-053-B
Extention
cable for
adjusting
(3P)
J-6082-291-A

Fig. 7-2.

7-1-2. Precautions

1. Switch settings

Adjust the switches to the following positions, and adjust unless specified otherwise.

1. Back up switch (MD-61, S104) ..... Off
2. Steady shot switch (MD-61, S101) ..... Off

2. Adjusting Procedure

Adjust in the given order.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the picture frame as shown in Fig. 7-3. if adjustments are performed using the color bar chart.
   (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and so that the white pattern will be displayed.
   Don't touch the zoom switch.

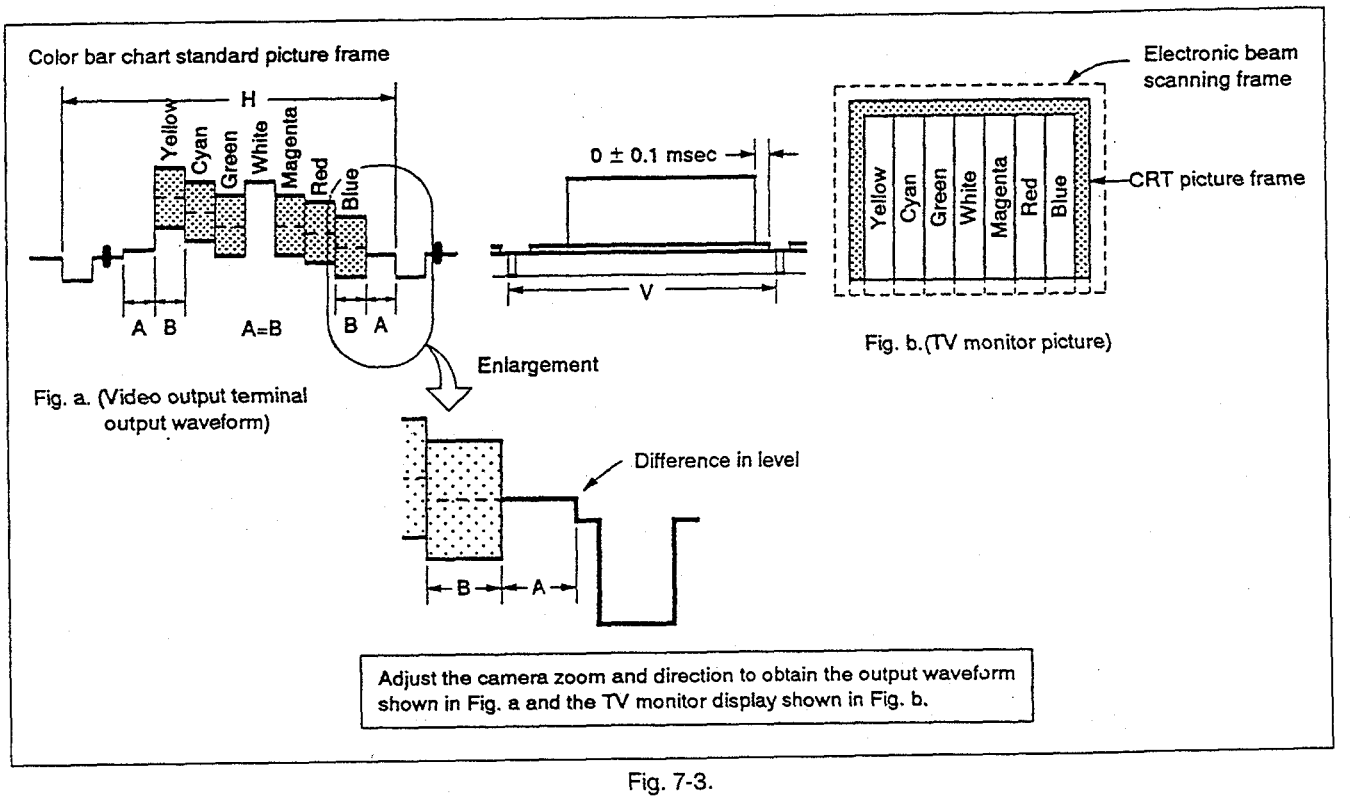


Fig. 7-3.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm X 841 mm) paper to a black one, and make the chart shown in Fig. 7-4.

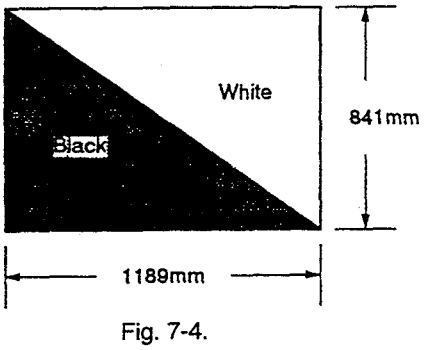


Fig. 7-4.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-3. Adjusting Remote Commander

Use the adjusting remote commander to change the coefficient of the digital signal processing or the EVR data.
The adjusting remote commander uses the remote commander signal line (ECCP) to perform the bidirectional communication with the camera microprocessor. The effect data of the bidirectional communication must be written in the nonvolatile memory.

1. Using the adjusting remote commander

1) Connect the adjusting remote commander to the ECCP terminal (MD-61 board CN101).
2) Adjust the HOLD switch of the adjusting remote commander to "HOLD" (SERVICE position).

If it has been properly connected, the LCD on the adjusting remote commander will display as shown in Fig. 7-5.

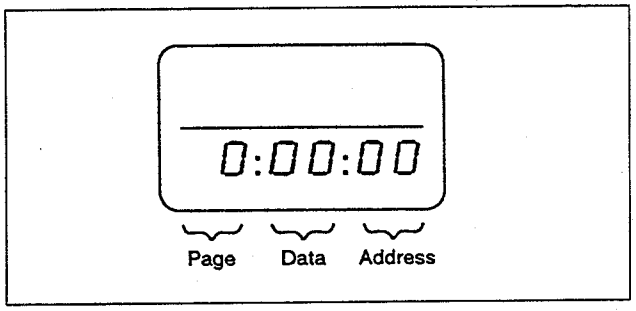


Fig. 7-5.

3) Operate the adjusting remote commander as follows.
   • Changing the page
     The page increases when the EDIT SEARCH+ button is pressed, and decreases when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD Display	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation Conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   • Changing the address
     The address increases when the FF (►►) button is pressed, and decreases when the REW (◄◄) button is pressed. There are altogether 256 addresses, from 00 to FF.
   • Changing the data (Data setting)
     The data increases when the PLAY (►) button is pressed, and decreases when the STOP (■) button is pressed. There are altogether 256 data, from 00 to FF.
   • Writing the adjustment data
     The PAUSE button must be pressed to write the adjustment data (F page) in the nonvolatile memory.
     (The new adjustment data will not be recorded in the nonvolatile memory if this step is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. Page F, and enables the camera section (Addresses 01 to BF of page F) to be adjusted.
5) After completing all adjustments, turn off the main power supply (6.3V) once.

2. Precautions upon using the adjusting remote commander

Mishandling of the adjusting remote commander may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be noted down before beginning adjustments and new adjustment data after each adjustment.

7-1-4. Page D address list

Note 1: The adjustment data initial value is the data input before performing camera section adjustments (Page D) if the Page D data has been erased due to some reason.

Note 2: The data written in the adjustment data memo comumn are fixed.
After adjusting, check that these data have not been re-written by mistake.

Note 3: In some case, data have been input to the page D address 43 to FF. This has no relation to the adjustment.

Note 4: No mark: EVI-330V
( ): EVI-331V

Address	Adjustment data	
	Initial value	Memo column
00	00	
01	00 (01)	80 (81)
02	00	18
03	00	00
04	00	00
05	00	00
06	00	00
07	72	77
08	60	60
09	00	00
0A	00	00
0B	00	00
0C	00	00
0D	00	00
0E	00	00
0F	00	00
10	00	00
11	30	00
12	00	30
13	2C	2C
14	00	00
15	08	08
16	06	06
17	00	00
18	00	00
19	00	00
1A	00	00
1B	00	00
1C	00	00
1D	00	00
1E	00	00
1F	30	00
20	00	00
21	2C	2C
22	00	00
23	08	08
24	06	06
25	00	00
26	00	00
27	00	00
28	00	00
29	00	00
2A	00	00
2B	00	00

Table 7-2 (1)

Address	Adjustment data	
	Initial value	Memo column
2C	00	00
2D	30	30
2E	00	00
2F	2C	2C
30	00	00
31	08	08
32	06	06
33	00	00
34	00	00
35	00	00
36	00	00
37	00	00
38	00	00
39	00	00
3A	00	00
3B	30	30
3C	00	00
3D	2C	2C
3E	00	00
3F	08	08
40	06	06
41	00	00
42	00	00
43	00	00
44	00	00
45	00	00
46	00	00
47	00	00
48	00	00
49	30	30
4A	00	00
4B	2C	2C
4C	00	00
4D	08	08
4E	06	06
4F	00	00
50	06	06
51	00	00
52	00	00
53	00	00
54	00	00
55	00	00
56	00	00
57	30	30
58	00	00
59	2C	2C
5A	00	00
5B	08	08

Table 7-2 (2).

Address	Adjustment data	
	Initial value	Memo column
5C	06	06
5D	00	00
5E	00	00
5F	00	00
60	00	00
61	00	00
62	18	18
63	14	14
64	02	02
65	0F	0F
66	00	00
67	00	00
68	03	03
69	01	01
6A	00	00
6B	00	00
6C	00	00
6D	00	00
6E	FE	FE
6F	FE	FE
70	FE	FE
71 to FF		

Table 7-2 (3).

7-1-5. Page F Address List

Note 1: The data already listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are values just after executing "Page F Data Initialization" and "Page F Data Modification". They are different from the values after executing all adjustments.

Note 3: In some cases, data have been input to the page F addresses C0 to EF. This has no relation to the adjustments.

Note 4: No mark: EVI-330V
( ): EVI-331V

Address	Adjustment data	
	Initial value	Memo column
00	00	C1(C2)
01	00(21)	00(21)
02	00	00
03	40	40
04	80	
05	80	
06	80	
07	80	
08	2D	
09	26	
0A	FA	
0B	F1	
0C	30	
0D	00	
0E	58	
0F	00	
10	E0	E0
11	8F	
12	6C	
13	36	
14	3C	
15	60	
16	0D	
17	A3	
18	12	
19	8E	
1A	10	
1B	E2	
1C	0C	0C
1D	00	00
1E	80	
1F	80	
20	79	79
21	79	79
22	80	80
23	77	77
24	5E(71)	5E(71)
25	75	75
26	45	45
27	3F	3F
28	23	
29	0B(0E)	0B(0E)

Table 7-3 (1).

Address	Adjustment data	
	Initial value	Memo column
2A	28(2C)	28(2C)
2B	40	40
2C	FF	FF
2D	26(42)	26(42)
2E	16	16
2F	26	26
30	00	00
31	00	00
32	46(4A)	46(4A)
33	00	00
34	50	50
35	35	35
36	02	02
37	00	00
38	83	83
39	6A	6A
3A	50	50
3B	80	80
3C	20	20
3D	C0	C0
3E	00	
3F	00	
40	00	
41	00	
42	00	
43	00	
44	00	
45	00	
46	00	
47	00	
48	00	
49	00	
4A	00	
4B	00	
4C	00	
4D	00	
4E	00	
4F	20	20
50	02	02
51	02	02
52	66	66
53	18	18

Table 7-3 (2).

Address	Adjustment data	
	Initial value	Memo column
54	6B	6B
55	9F	9F
56	66	66
57	6C	6C
58	5C	5C
59	83	83
5A	67	67
5B	5C	5C
5C	5C	5C
5D	4A	4A
5E	20	20
5F	5C	5C
60	3C	3C
61	33	33
62	0C	0C
63	26	26
64	24	24
65	A0	A0
66	04	04
67	05	05
68	00	00
69	00	00
6A	04(00)	04(00)
6B	00	00
6C	04(00)	04(00)
6D	00	00
6E	02	02
6F	33	33
70	B0	B0
71	18	18
72	0F	0F
73	0F	0F
74	00(02)	00(02)
75	43	47
76	1B	1B
77	E8(D8)	E8(D8)
78	A0	A0
79	30(28)	30(28)
7A	10(0D)	10(0D)
7B	50	50
7C	58	58
7D	88	88

Table 7-3 (3).

Address	Adjustment data	
	Initial value	Memo column
7E	66	66
7F	46	46
80	8F	8F
81	00	00
82	20	20
83	18	18
84	02	02
85	08	08
86	40	40
87	20	20
88	40	40
89	30	30
8A	50	50
8B	60	60
8C	80	80
8D	23(27)	23(27)
8E	60(6C)	60(6C)
8F	00	00
90	00	00
91	77	77
92	00	00
93	FB	FB
94	04	04
95	32	32
96	6B	6B
97	8D	8D
98	A1	A1
99	30	30
9A	30	30
9B	21	21
9C	91	91
9D	72	72
9E	00	00
9F	00	00
A0	00	00
A1	00	00
A2	00	00
A3	00	00
A4	02	02
A5	80	80
A6	00	00
A7	80	80

Table 7-3 (4).

Address	Adjustment data	
	Initial value	Memo column
A8	00	00
A9	80	80
AA	00	00
AB	80	80
AC	00	00
AD	00	00
AE	02	02
AF	44(87)	44(87)
B0	3D(39)	3D(39)
B1	25	25
B2	3D(39)	3D(39)
B3	25	25
B4	12(32)	12(32)
B5	4B(4A)	4B(4A)
B6	40	40
B7	68	68
B8	00	00
B9	80	80
BA	00	00
BB	00	00
BC	00	00
BD	00	00
BE	6B(6C)	6B(6C)
BF	2F(33)	2F(33)
C0 to EF		
F0		
F1		
F2		
F3		
F4		
F5		
F6		
F7		
F8		
F9		
FA		
FB		
FC		
FD		
FE		
FF		

Table 7-3 (5).

7-1-6. Data Processing

The calculation of the adjusting remote commander display data (hexadecimal notation) is required for obtaining the adjustment data of some adjustment itemes. In this case , after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-4. indicates the hexadecimal notation-the decimal notation calculation table.

Hexagecimal notation-Decimal notation

The lower digits of the hexadecimal notation / The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (R)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (R)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① → B (b)	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

② ↓

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the adjusting remote control unit display is BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (VC-170 board)

Subject	Option
Measuring instrument	Digital voltmeter
MT5V check	
Measurement point	Pins ⑥ and ⑧ of CN501
Specified value	4.9 ± 0.1 Vdc
D 3.5V check	
Measurement point	Pin ⑬ and ⑭ of CN504
Specified value	3.55 ± 0.1 Vdc
CAM 4.9V check	
Measurement point	Pis ⑰ and ⑱ of CN504
Specified value	4.9 ± 0.1 Vdc
CAM15V check	
Measurement point	Pin ① of CN401
Specified value	15.2 ± 0.3 Vdc
CAM -8.5V check	
Measurement point	Pin ③ of CN401
Specified value	$-8.5\ ^{+0.25}_{-0.4}$ Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page D Data Initialization

Note: It is necessary to perform all adjustments of the camera section form the beginning again if the data of page F has been initialized.

Initializing method:

1) Page: 1, address: 00, data: 01
2) Check that the data of page: 1, address: 03 is 00.
   • EVI-330V (NTSC)
3) Set data: 01 to page: 1, address: 02, and press the PAUSE button of the adjusting remote commander.
   • EVI-331V (PAL)
   Set data: 02 to page: 1, address: 02, and press the PAUSE button of the adjusting remote commander.
4) Check that the data of page: 1, address: 03 is 01.
5) Set data: 00 to page: 1, address: 02, and press the PAUSE button of the adjusting remote commander.
6) After perfoming "Page D data modification", perform all the adjustments of the camera section (page D).

3. Page D Data Modification

The data (initial data) that is automatically written on page D after the initialization of the page D data will differ according to some camera micro processor versions. Change the data by manual input, arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote commander every time the new data is set.

EVI-330V

Address	Data
01	80
02	18
07	77

EVI-331V

Address	Data
01	81
02	18
07	77

4. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Page: 6, address: 00, data: 01
2) Check that the data of page: 6, address: 11 is 00.
3) • EVI-330V (NTSC)
   Set data: 2D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   • EVI-331V (PAL)
   Set data: 2F to page: 6, address: 01 and press the PAUSE button of the adjusting remote commander.
4) Check that the data of page: 6, address: 11 is 01.
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote commander.
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

5. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data will differ according to some camera micro processor versions. Change the data by manual input, and arrange it.

EVI-330V

Address	Data
70	47

EVI-331V

Address	Data
70	47

[Distinguishing the Camera Micro Processor (VC-170 Board IC502) Versions]

Each version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 10.

Version	Part Name	Page:6 Address: 10
Ver. 1.0	SC424624	20

[Distinguishing the Steady Shot Control Micro Processor (VC-170 Board IC607) Versions] (EVI-330T/331T)

Each version can be distinguished by looking at the part name of the steady shot control micro processor or the data of page: 6, address: 30.

Version	Part Name	Page:6 Address: 30
Ver. 1.0	CXP81120-003R	10

Note 1: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote commander every time the new data is set.

Note 2: When changing address: 00, set the data of page: 6, address: 00 to 80.

6. 28 MHz Original Oscillation Adjustment (VC-170 board)

Adjust the 28 MHz oscillation of the synchronization clock.
If the oscillation is not 28 MHz, the period will be inaccurate or the image will not be in color.

Subject	Not required
Measurement Point	CL401(IC402 ⑫ pin)
Measuring Instrument	Frequency counter
Adjusting Element	CT401
Specified Value	14318181 ± 71Hz(NTSC) 14187500 ± 70Hz(PAL)

Adjusting method:

1) Use CT401 to adjust the oscillation frequency to 14318181±71 Hz (14187500 ± 70Hz).

7. V SUB Adjustment

Set the CCD imager V SUB voltage to the voltage specified for the imager.

Subject	Not required
Adjustment Page	F
Adjustment Address	04

Adjusting Method:

1) Read the V SUB voltage code of the CCD imager. Obtain the corresponding V SUB data from the following table.
2) Set data: 01 to page: 6, address: 00.
3) Set the V SUB data to page: F, address: 04.
4) Press the PAUSE button of the adjusting remote commander.

V SUB			V SUB		
Voltage Code	Data	Voltage (Vdc) *1	Voltage Code	Data	Voltage (Vdc) *1
e	70	9.0	q	AC	14.0
f	77	9.5	r	B2	14.5
g	7C	10.0	s	B8	15.0
h	82	10.5	t	BE	15.5
j	88	11.0	u	C4	16.0
k	8E	11.5	v	CA	16.5
l	94	12.0	w	D0	17.0
m	9A	12.5	x	D6	17.5
n	A0	13.0	y	DD	18.0
p	A6	13.5	z	E2	18.5

8. VRG Adjustment

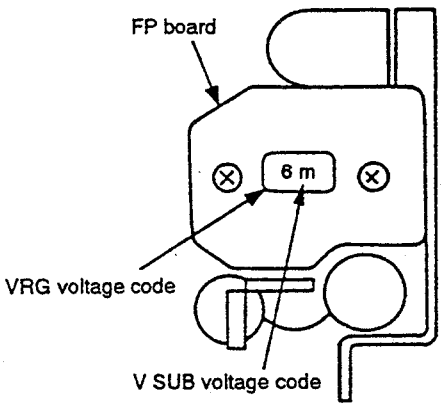
Set the CCD imager V RG voltage to the voltage specified for the imager.

Subject	Not required
Adjustment Page	F
Adjustment Address	05

Adjusting Method:

1) Read the VRG voltage code of the CCD imager. Obtain the corresponding VRG data from the following table.
2) Set data: 01 to page: 6, address: 00.
3) Set the VRG data to page: F, address: 05.
4) Press the PAUSE button of the adjusting remote commander.

VRG		
Voltage Code	Data	Voltage(Vdc) *2
1	34	1.0
2	4E	1.5
3	69	2.0
4	83	2.5
5	9E	3.0
6	B8	3.5
7	D3	4.0



(Example) When "6m" is displayed:
The V SUB voltage code is "m" and therefore the V SUB data will be "9B".
The VRG voltage code is "6" and therefore the VRG data will be "B8".

Fig. 7-6.

9. Flange Back Adjustment

The flange back adjustment for the inner focus lens is performed automatically.

Subject	Chart for flange back adjustment (2000 ± 5mm from the front side of the lens, Luminance: 300 ± 50 lux)
Measurement Point	Check the operation on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	16, 17, 18, 19, 1A, 1B

Adjusting method:

1) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
2) Set data: 01 to page: 6, address: 00.
3) Check that the data of page: 6, address: 21 is 00.
4) Check that the page: F, address: 16 to 1B data is at the initial value. (Refer to Table 7-3. "Page F address list")
5) Set data: 13 to page: 6, address: 01 and press the PAUSE button of the adjusting remote commander.
6) Set data: 15 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (The adjustmnet data is automatically input to page: F, addresses: 16 to 1B.)
7) Check that the data of page: 6, address: 21 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (2m from the front of the lens)
Measurement Point	TV monitor
Measuring Instrument	
Specified Value	Focused at the TELE end and WIDE end.

Checking method:

1) Place the Siemens star 2m from the front of the lens.
2) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
3) Shoot the siemens star with the zoom TELE end.
4) Turn ON the auto focus.
5) When the lens is focused, turn OFF the auto focus. (Note 2)
6) Shoot the siemens star with the zoom WIDE end.
7) Check that the lens is focused.

Note 1: When the auto focus is ON, the lens can be checked if it is focused or not by observing the data on page A of the adjusting remote commander.

1) Set data: 0C to page: 6, address: 02.
2) Page A shows the state of the focus.
   A: 00: XX
   (Odd: Focused
   Even: Unfocused)

Processing after compleating adjustments

1) Set data: 00 to page: 6, address: 02.

11. HALL Adjustment

To eliminate the differences in the outputs of the hall element attached to the iris for detecting the position of the lens iris, adjust the hall AMP gain and hall offset.

Subject	Not required
Measurement Point	Lower 2 digits of the date of the page A displayed
Measuring Instrument	
Adjustment Page	F
Adjustment Address	06, 07
Specified Value	33 to 37 during IRIS OPEN B4 to B8 during IRIS CLOSE

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 03 to page: 6, address: 02.
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Set data: 80 to page: F, address: 07, and press the PAUSE button of the adjusting remote commander.
5) Set data: 40 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
6) Read the page A display data, and this data is named W2.
7) Set data: 30 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
8) Read the page A display data, and this data is named W1.
9) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
10) Read the page A display data, and this data is named K1.
11) Set data: 40 to page: F, address: 06, and press the PAUSE button.
12) Read the page A display data, and this data is named K2.
13) Convert W1, W2, K1, K2 to decimal notation, and obtain W1', W2', K1', K2'. (Refer to Table 7-4. "Hexadecimal notation-decimal notation conversion table".)
14) Calculate X1' using the following equations (decimal notation calculation).

$$A' = W2' + K1' - W1' - K2' \quad \text{..... Equation 1}$$

$$B' = W1' - K1' \quad \text{..... Equation 2}$$

$$X1' = \frac{2080 + (48 \times A') - (16 \times B')}{A'} \quad \text{..... Equation 3}$$

15) Convert X1' to hexadecimal notation, and obtain X1. (Round off to one decimal place)
16) Set data: X1 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
17) Change the data of page: F, address: 07, and adjust the page A display data to "35".
18) Press the PAUSE button of the adjusting remote commander.
19) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
20) Read the page A display data, and this data is named W0. If W0 lies within the "B4" to "B8" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
21) Convert W0 to hexadecimal notation, and obtain W0'.
22) Calculate X2' using the following equations (decimal notation calculation).

$$C' = W0' - B' - 52 \quad \text{..... Equation 4}$$

$$X2' = \frac{(130 - B') \times (X1' - 48) + 48 \times C}{C'} \quad \text{..... Equation 5}$$

(X1' and B' are values obtained from equations 2 and3)

23) Convert X2' to hexadecimal notation and obtain X2. (Round off to one decimal place)
24) Set data X2 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
25) Change the data of page: F, address: 07, and adjust the page A display data to "B6".
26) Press the PAUSE button of the adjusting remote commander.
27) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
28) Check that the page A display data lies within the "33" to "37" range.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

12. Picture Frame Setting

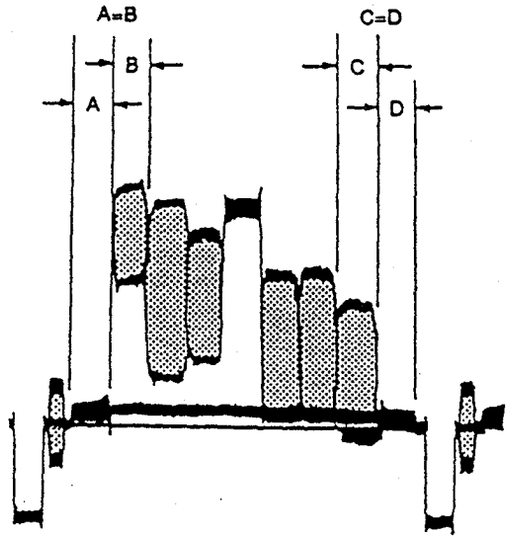
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Turn the auto focus off.
2) Adjust the focus.
3) Adjust the zoom and the camera direction, and set to the specified position.
4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame".

Check on the osscilloscope

1. Horizontal period



2. Vertical period

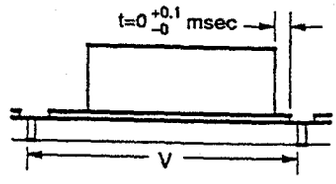


Fig. 7-7.

Check on the TV monitor

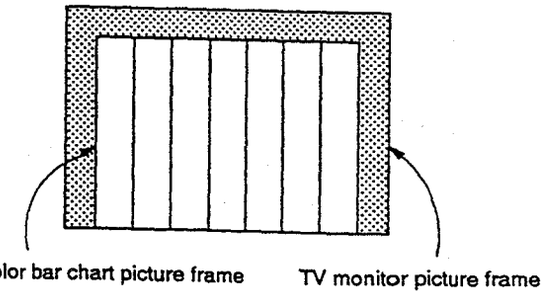


Fig. 7-8.

13. Color Reproduction Adjustment

Adjust the color separation matrix coefficient so that the proper color reproduction is produced.

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	08, 09, 0A, 0B
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 00 to page: 6, address: 03.
3) Set data: F1 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
4) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
5) Change the data of addresses 08, 09, 0A and 0B of page: F, and settle each color luminance point in each color reproduction frame.

Note 1: Be sure to press the PAUSE button of the adjusting remote commander before changing the addresses.
If not, the new data will not be written to the memory.

6) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: E0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
2) Set data: 26 to page: F, address: 63, and press the PAUSE button of the adjusting remote commander.
3) Set data: 10 to page: 6, address: 03.

For EVI-330V
Burst position

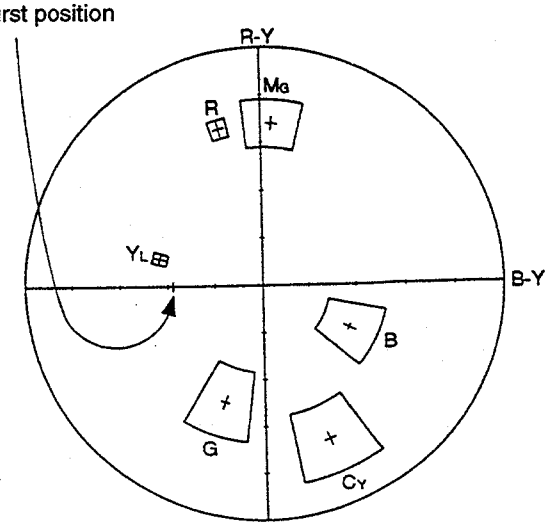


Fig. 7-9.

For EVI-331V
Burst position

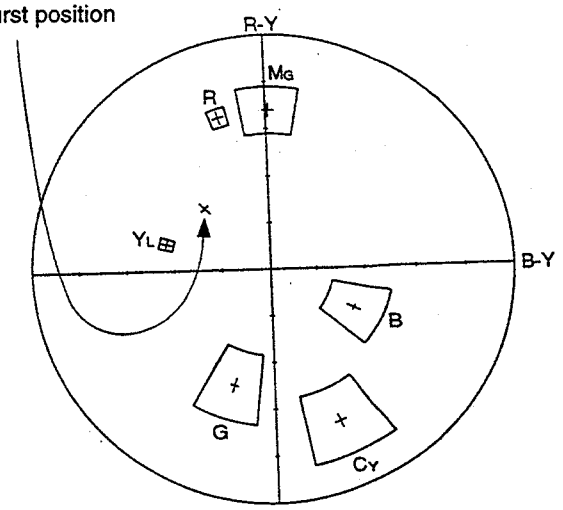


Fig. 7-10.

14. IRIS IN/OUT Adjustment (VC-170 board)

For the unit to judge if the white balance is indoors or outdoors in auto white balance operations, measure the light level and write it in the EEPROM.
If the level is not correct, the white balance will not be accurate.

Subject	White pattern
Measurement Point	Lower 2 digits of the date of the page A displayed
Measuring Instrument	
Adjustment Page	F
Adjustment Address	13, 14

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 0E to page: 6, address: 02.
3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Read the page A display data (Note 1), and take the upper two digits as D1 and the lower two as D2.
5) Convert D1 to a decimal number and obtain D1'. (Refer to Table 7-4. "Hexadecimal Notation-Decimal Notation Conversion Table".)
6) Calculate D3' using the following equations. (Equations 1 and 2 are for decimal notation calculation)
   When D2 ≧ D0
   D3'=D1'-21 ..... Equation 1
   When D2 < D0
   D3'=D1'-22 ..... Equation 2
7) Convert D3' to a hexadecimal number and obtain D3.
8) Set D3 to page: F, address: 13, and press the PAUSE button of the adjusting remote commander.
9) Set data: 09 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (IND0.5 SHUTTER mode setting)
10) Read the page A display data (Note 1), and take the upper two digits as D4 and the lower two as D5.
11) Convert D4 to a decimal number and obtain D4'. (Refer to Table 7-4. "Hexadecimal Notation-Decimal Notation Conversion Table".)
12) Calculate D6' using the following equations. (Equations 3 and 4 are for decimal notation calculation)
   When D5 ≧ F0
   D6'=D4'-13 ..... Equation 3
   When D5 < F0
   D6'=D4'-14 ..... Equation 4
13) Convert D6' to a hexadecimal number and obtain D6.
14) Set D6 to page: F, address: 14, and press the PAUSE button of the adjusting remote commander.

Note 1: The right four digits of the display data at the right bottom side of the EVF and monitor TV is the LIGHT LEVEL data. If the lower digits change severely and cannot be read, record it on a tape once, play it back by frame feeding, and obtain the average value.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 02.

15. MAX GAIN Adjustment (VC-170 board)

Correct the differences in the minimum illuminance.
If the illuminance is not consistent, the image level required for taking subjects in low illuminance will not be produced (dark).

Subject	White pattern standard picture frame
Measurement Point	Video out
Measuring Instrument	Oscilloscope
Adjusting Page	F
Adjustment Address	15
Specified Value	EVI-330V A=450mV EVI-331V A=460mV

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 04 to page: F, address: 2D.
3) Set data: 19 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Change the data of page: F, address: 15, and adjust so that the signal level (A) becomes the specified value.
   Note: The data of address: 15 should be 70 to FF.
5) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
2) Return the data page:F Address: 2D to an initialized value.

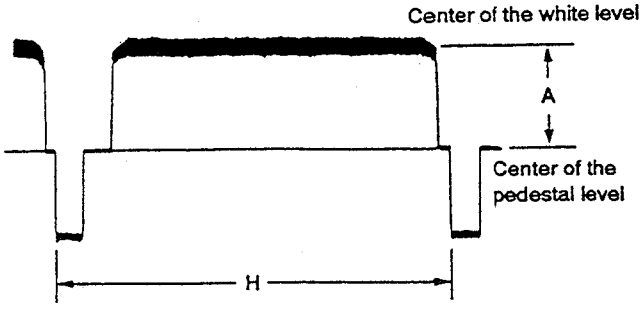


Fig. 7-11.

16. Auto White Balance Standard Data Input

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	0C, 0D, 0E, 0F

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Set data: 01 to page: 6, address: 00
3) Check that the data of page: 6, address: 11 is 00.
4) Wait for 2 seconds.
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (When the stadard data is taken in, the data will be automatically input to addresses 0C to 0F of page F.)
7) Check that the data of page: 6, address: 11 is 01.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

17. Auto White Balance Adjustment

Adjust to the proper auto white balance output data.
If it is not correct, auto white balance and color reproducibility will be poor.

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the 2 digits of page A displayed
Measuring Instrument	
Adjustment Page	F
Adjustment Address	11, 12
Specified Value	R ratio: 2B40 to 2BC0 B ratio: 5E00 to 5F00

Adjusting method:

1) Place the C14 filter for color temperature correction on the lens.
2) Set data: 01 to page: 6 address: 00.
3) Set data: D0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
4) Set data: 04 to page: 6, address: 02.
5) Change the data of page: F, address: 11, and adjust the average value of the page A display data to the R ratio specified value.
6) Press the PAUSE button of the adjusting remote commander.
7) Set data: 05 to page: 6, address: 02.
8) Change the data of page: F, address: 12, and adjust the average value of the page A display data to the B ratio specified value.
9) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: E0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 02.

18. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	7-12. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 01 to page: 6, address: 00.
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-12. A.
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Set data: 23 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
7) Place the C14 filter on the lens.
8) Check that the center of the white luminance point settles in the circle shown in Fig. 7-12. B.
9) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
10) Check that the center of the white luminance point settles in the circle shown in Fig. 7-12. C.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 00, and press the PAUSE button.

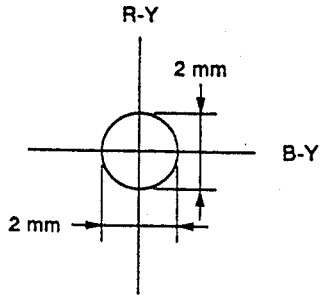


Fig. 7-12. A

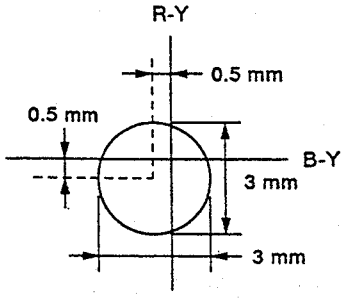


Fig. 7-12. B

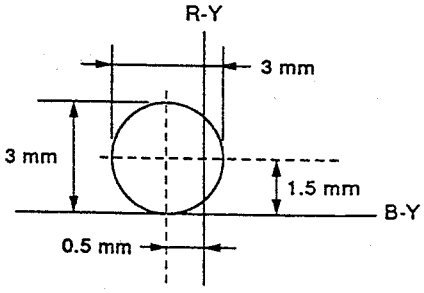


Fig. 7-12. C

19. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=660 ± 40 mV SYNC level=285 ± 20 mV BURST level=285 ± 20 mV

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

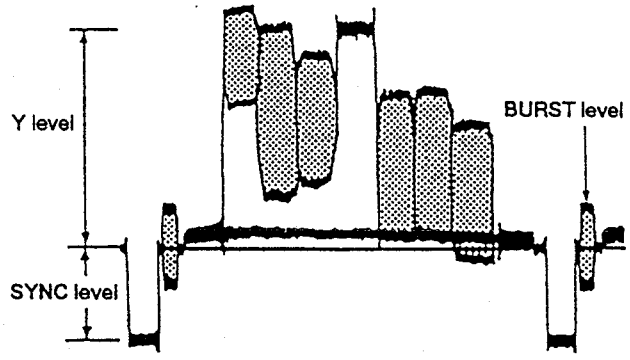


Fig. 7-13.

8. VISCA COMMAND LIST

8-1. VISCA Summary

EVI-330V/331V uses a protocol called VISCA. In VISCA, the computer or other device issuing the commands is called the controller and the EVI-330V/331V or other device receiving those commands is called the peripheral device. Under VISCA, up to 7 EVI-330V/331V can be connected to one controller using RS-232C communications. The RS-232C parameters are communications speed of 9600 baud, data length of 8 bits, 1 stop bit, 1 start bit, and no parity. Flow control, such as XON/XOFF and RTS/CTS, is not used. The EVI-330V/331V are connected in a daisy chain. The actual internal connections form a one-way ring, as shown in the figure below, so messages pass through all the EVI-330V/331V and return to the controller. Each device has an address on this network. The address of the controller is always 0. The addresses of the EVI-330V/331V are numbered 1, 2, 3, etc., in order from closer to the controller to farther away. As part of the initialization operations, the controller sends the address command (see page 8) to set the addresses for the EVI-330V/331V.

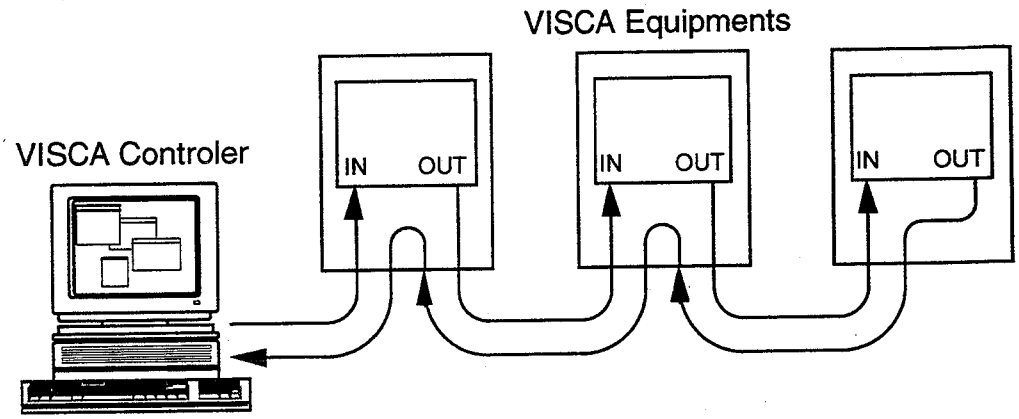
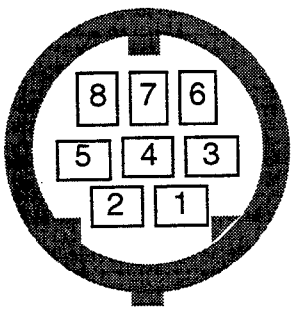


Figure 1. VISCA Network

EVI-330V/331V has a VISCA IN port and a VISCA OUT port. As viewed from the outside, both the VISCA IN and VISCA OUT ports have the connector pin layout shown in Figure 2. During control by a computer, set the EVI-330V/331V DTR input (the computer's DSR output) high.



1. DTR	Data Transmission Ready (OUTPUT)
2. $\overline{\text{DSR}}$	Data Set Ready (INPUT)
3. TXD	Transmit Data (OUTPUT)
4. GND	Ground
5. $\overline{\text{RXD}}$	Receive Data (INPUT)
6. GND	Ground
7. OPEN	Not Used
8. OPEN	Not Used

Figure 2. VISCA Connector

8-2. RS-232C Connection

Figure 3. shows the connections between Apple Macintosh and EVI-330V/331V.
In case of controlling 1 EVI-330V/331V, VISCA Output is not required.

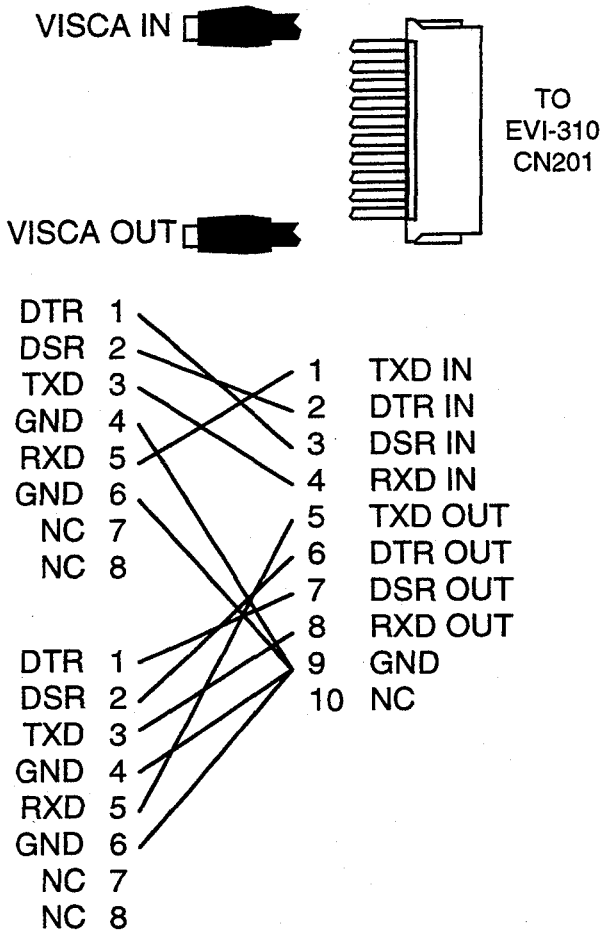


Figure 3. VISCA Connection (Mini DIN-8)

Figure 4. shows the connections between IBM PC/AX series or D-SUB 9 serial port and EVI-330V/331V.
Figure 5. shows the connections between NEC PC9801 series, Fujitsu FM-TOWNS series or D-SUB 25 serial port and EVI-330V/331V.
In case of controlling 1 EVI-330V/331V, VISCA Output is not required.

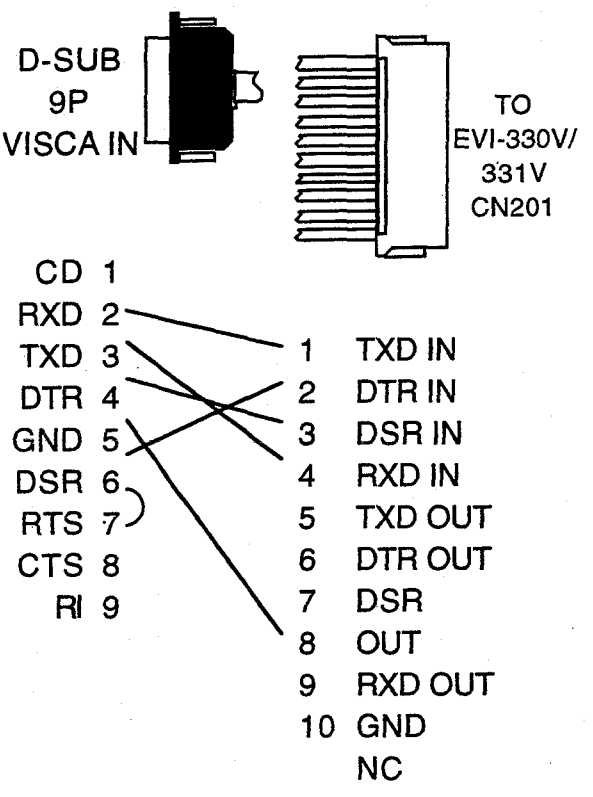


Figure 4. VISCA Connection (D-SUB 9P)

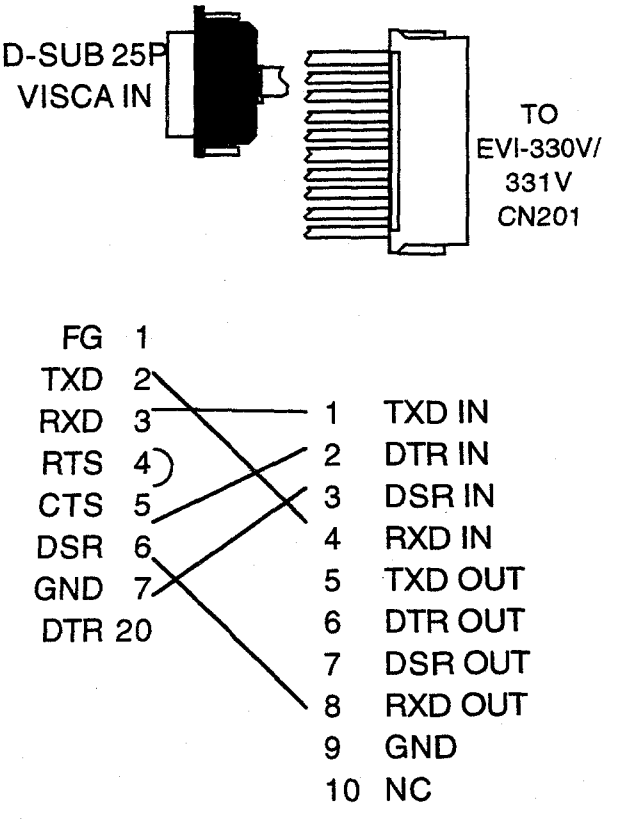


Figure 5. VISCA Connection (D-SUB 25P)

8-3. VISCA Communication Formats

VISCA Packet Structure

The basic unit for VISCA communications is the packet (shown in Figure 6). The first byte 1 in the packet is the header. It contains the sender and destination addresses. For example, the header for a packet sent from the computer at address 0 to EVI-330V/331V at Address 1 is 81H (hexadecimal).
A packet sent to EVI-330V/331V at Address 2 has a header of 82H. In the tables starting on page 8, the header is listed as 8X. Insert the EVI-330V/331V address in place of the X. The header for a packet sent in response from the EVI-330V/331V at Address 1 is 90H. For a response packet form the EVI-330V/331V at Address 2, the header is A0H.
Some of the EVI-330V/331V setting commands (see page 8) can be sent to all the equipment at one time (broadcast). For a broadcast, the header is 88H.
The terminator, FFH, ends the packet.

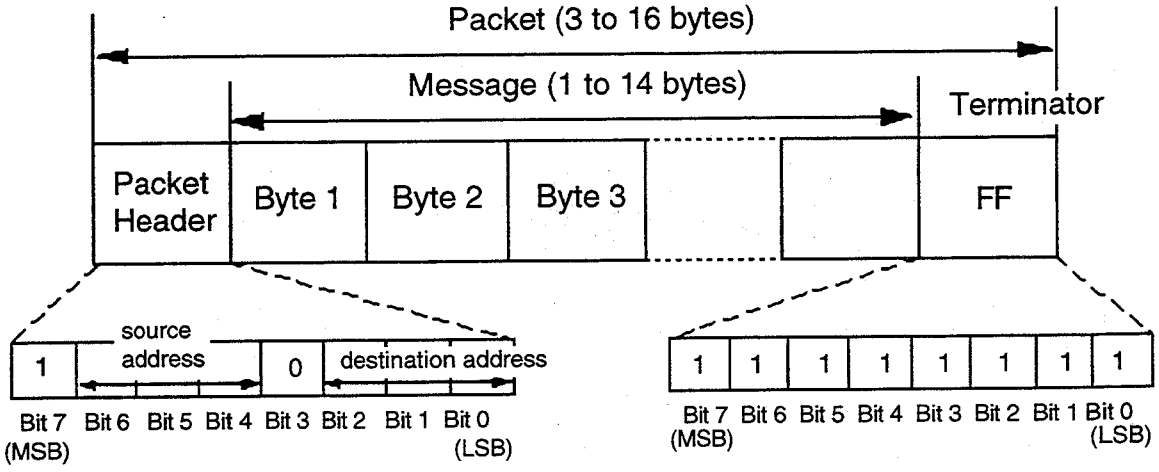


Figure 6. VISCA Message Packet

Commands and Inquiries

Commands: Instruct the EVI-330V/331V to carry out operations. Except for EVI-330V/331V setting commands, Byte 2 can be used to specify when to execute. When Byte 2 is 01H (Format 1), this means immediate execution. When Byte 2 is 02H (Format 2), the command is to be executed when the VISCA clock (see page 8) reaches the time given by Bytes 4-8. When Byte 2 is 03H (Format 3), the command is to be executed when the tape position is at or beyond (toward the tape end) the tape position given by Bytes 4-8. When Byte 2 is 04H (Format 4), the command is to be executed when the tape position is at or before the tape position given by Bytes 4-8. In the tables from page 9 on, the packets are written in Format 1.

	Command Packet	Note
Format 1	8X 01 RR ... FF	RR=category code*
Format 2	8X 02 RR HH MM SS TT 0T ... FF	RR=category code*
		HH=hours,MM=minuites,SS=seconds,TTT=ticks
Inquiry	8X 09 RR ... FF	RR=category code*

*category code = 00 (Interface), 04 (IF-51 Board)
*X = 1 to 7 : Address of EVI-330V/331V.

Responses to Commands and Inquiries

ACK message: Returned by EVI-330V/331V when it has received a command

Completion message: Returned by EVI-330V/331V when it has completed execution of a command or inquiry inspection for an inquiry instruction, the response data is from the 3rd byte on of the message packet.

	Reply Packet	Note
Ack	X0 4Y FF	Y=socket number
Completion (commands)	X0 5Y FF	Y=socket number
Completion (Inquiries)	X0 5Y ... FF	Y=socket number

X = 9 to F : EVI-330V/331V address + 8

Error message: The EVI-330V/331V returnes an error message instead of a completeion message when it cannot execute a command or inquiry instruction or when execution fails.

Error Packet	Description
X0 6Y 01 FF	Message length error (>14bytes)
X0 6Y 02 FF	Syntax Error
X0 6Y 03 FF	Command buffer full
X0 6Y 04 FF	Command cancelled
X0 6Y 05 FF	No socket (to be cancelled)
X0 6Y 41 FF	Time out
X0 6Y 44 FF	Camera mode (attempted VCR command)

X = 1 to 7 : EVI-330V/331V address, Y = socket number

Socket Number

When a command message is sent to a EVI-330V/331V, the controller usually waits for the completion message or error message from that EVI-330V/331V before sending the next message. However, in order to provide higher level usage, the EVI-330V/331V has two command buffers (memories) so it can receive up to two commands (including the one it is executing) at a time. When the EVI-330V/331V receives a command, it sets the socket number in the ACK message to tell the controller which command buffer is used.

Since this socket number is also included in the completion message or error message, the controller can see which command was completed. Even when the EVI-330V/331V is using both commands and inquiries, no ACK message is returned, but rather a completion message with Socket Number 0 is returned.

Command Execution Stop

To cancel a command that you have already sent, send the IF_Clear cammand (see page 8). To cancel just one cammand when you have already sent two, use a cancel message.

	Cancel Packet	Note
Cancel	8X 2Y FF	Y=sockt number

X = 1 to 7 : EVI-330V/331V address, Y = socket number

VISCA clock

The EVI-330V/331V has an internal clock, called the VISCA clock. The values of the VISCA are from 00h 00m 00s 0 ticks to 23h 59m 59s 299 ticks. This clock starts moving when the EVI-330V/331V power comes on and continues to increment. One tick = 1/300 second. After 23h 59m 59s 299 ticks, the clock returns to 0. When the computer RS-232C DTR line goes low, then returns to high, the VISCA clock is reset to 0. When a command in Format 2 is used, an execution time up to 12 hours later (*1) can be specified using this VISCA clock. Please be aware that the precision of the VISCA clock as a clock is not assured.

(*1) If over 12h 00m 00s 001 ticks is specified, it executes immediately.

8-4. EVI-330V/331V Setting Commands (Network setting)

Before starting EVI-330V/331V control, always broadcast the Address command and the IF_Clear command.

VISCA Network Management Commands

Address: Set the address for EVI-330V/331V. This command is used when the network is initialized and when the network change message below is received. (See the VISCA communications examples on page 14)

Network Change: This command is sent from EVI-330V/331V to the controller when a device is removed from or added to the network. When this message is received, the controller needs to reset the address.

	Packet	Notes
Address	88 30 01 FF	Always broadcasted.
Network Change	X0 38 FF	

X = 9 to F : EVI-330V/331V address + 8

VISCA Interface Commands (Format 1 only)

IF_Clear: Clears the command buffers in the EVI-330V/331V and stops the instruction being executed.

IF_ClockSet: This is a command for setting the VISCA clock, but it is not usually used. Rather the VISCA clock is reset by dropping the RS-232C DTR terminal low, then returning it to high. For details on using this command, see the VISCA Developer's manual

	Command Packet	Reply Packet	Notes
IF_Clear	8X 01 00 01 FF	X0 50 FF	
IF_Clear (broadcast)	88 01 00 01 FF	88 01 00 01 FF	
IF_ClockSet	88 01 00 03 HH MM SS TT 0T	88 01 00 03 HH MM SS TT 0T	time_set
(broadcast)	HH MM SS TT 0T FF	HH MM SS TT 0T FF	time_increment

X = 1 to 7 : EVI-330V/331V address (Inquiry packet)
= 9 to F : EVI-330V/331V address + 8 (reply packet)

VISCA Interface Inquiries

IF_DeviceTypeInq: Returns data about the VISCA interface.

IF_ClockInq: Returns the current time of the VISCA clock.

Inquiry	Inquiry Packet	Reply Packet	Description
IF_DeviceTypeinq	8X 09 00 02 FF	Y0 50 GG GG HH HH JJ JJ KK FF	GGGG=Vender ID (0001 : Sony) HHHH=Model ID [*1] JJJJ=ROM revision KK=Maximum socket # (02)
IF_ClockInq	8X 09 00 03 FF	Y0 50 HH MM SS TT 0T VV 0V FF	HH=hours MM=minuites SS=seconds TTT=ticks VVV=ticks/second (300)

X = 1 to 7 : EVI-330V/331V address (Inquiry packet)
Y = 9 to F : EVI-330V/331V address + 8 (reply packet)

8-5. EVI-330V/331V/ Commends

Action

Command Set	Command	ECCP Code W1 (b0-b7)	VISCA Code	Cmmnts
CAM_Zoom	Tele	10101100	8X 01 04 07 02 FF	strm
	Wide	11101100	8X 01 04 07 03 FF	strm
	Stop	-	8X 01 04 07 00 FF	
CAM_Focus	Far	10100010	8X 01 04 08 02 FF	strm
	Near	11100010	8X 01 04 08 03 FF	strm
	Stop	-	8X 01 04 08 00 FF	
CAM_Shutter	Up	10011010	8X 01 04 0A 02 FF	
	Down	11011010	8X 01 04 0A 03 FF	
	Reset	10111010	8X 01 04 0A 00 FF	
CAM_IRIS	Up	11001010	8X 01 04 0B 02 FF	
	Down	10101010	8X 01 04 0B 03 FF	
	Reset	11101010	8X 01 04 0B 00 FF	
CAM_Gain	Up	11010110	8X 01 04 0C 02 FF	
	Down	10110110	8X 01 04 0C 03 FF	
	Reset	11110110	8X 01 04 0C 00 FF	
CAM_Bright	Up	11010010	8X 01 04 0D 02 FF	
	Down	10110010	8X 01 04 0D 03 FF	
	Reset	11110010	8X 01 04 0D 00 FF	
CAM_ExpCmpnst	Up	10001110	8X 01 04 0E 02 FF	
	Down	11001110	8X 01 04 0E 03 FF	
	Reset	10101110	8X 01 04 0E 00 FF	

x=1~7 : address

Sub Control

Command Set	Command	ECCO Code w1	VISCA Code	Cmmnts
CAM_SubControl	WB One Push Triger	11101110	8x 01 04 10 05 FF	
CAM_Controller	Cntrller ON (KeyLock ON)	11000000 11000000 10000000 00000000	8x 01 04 17 02 FF	
	Cntrller OFF (KeyLock OFF)	11000000 11000000 00000000 00000000	8x 01 04 17 00 FF	

x=1~7 : address

Mode

Command Set	Command	ECCP Code w1	VISCA Code	Cmmnts
CAM_WBMode	Auto	11000000 01000000 00000000 00000000	8X 01 04 35 00 FF	
	Indoor	11000000 01000000 10000000 00000000	8X 01 04 35 01 FF	
	Outdoor	11000000 01000000 01000000 00000000	8X 01 04 35 02 FF	
	One Push	11000000 01000000 11000000 00000000	8X 01 04 35 03 FF	
CAM_AFMode	AF ON/OFF	10000010	8X 01 04 38 10 FF	
CAM_AEMode	Full Auto	11000000 00000000 00100000 00000000	8X 01 04 39 00 FF	
	Manual	11000000 00000000 00000000 00000000	8X 01 04 39 03 FF	
	Shutter	11000000 00000000 01000000 00000000	8X 01 04 39 0A FF	
	IRIS	11000000 00000000 11000000 00000000	8X 01 04 39 0B FF	
	Bright	11000000 00000000 10000000 00000000	8X 01 04 39 0D FF	
CAM_ECMode	ON	11111110	8X 01 04 3E 02 FF	
	OFF	10000001	8X 01 04 3E 03 FF	
CAM_Memory	Set	11000000 10000000 Z0 01000000	8X 01 04 3F 01 0Z FF	No. 0Z
	Recall	11000000 10000000 Z0 10000000	8X 01 04 3F 02 0Z FF	No. 0Z
	Reset	11000000 10000000 Z0 11000000	8X 01 04 3F 00 0Z FF	No. 0Z

x=1~7 : address

Position

Command Set	Command	ECCP Code w1(b0-b7)	VISCA Code	Cmmnts
CAM_ZoomPos	Set	10000000 0000000 ZZ YY	8X 01 04 47 0Y0Y 0Z 0Z FF	
CAM_FocusPos	Set	10000000 10000000 ZZ YY	8X 01 04 48 0Y0Y 0Z 0Z FF	
CAM_ShutterPos	Set	10000000 01000000 ZZ YY	8X 01 04 4A 0Y0Y 0Z 0Z FF	
CAM_IRISPos	Set	10000000 11000000 ZZ YY	8X 01 04 4B 0Y0Y 0Z 0Z FF	
CAM_Gain Pos	Set	10000000 00100000 ZZ YY	8X 01 04 4C 0Y0Y 0Z 0Z FF	
CAM_ECPos	Set	10000000 10100000 ZZ YY	8X 01 04 4E 0Y0Y 0Z 0Z FF	

x=1~7 : address

8-6. EVI-330V/331V Inquiry Commands

Action

Inquiry	VISCA Code Inquiry	ECCP Code W1	VISCA Code Reply	ECCP Code W3	Description
CAM_PowerInq	8X 09 04 00 FF	-	X0 50 02 FF	-	ON
			X0 50 03 FF	-	OFF

x=1~7 : address (Inquiry), x=9~f : address +8(Reply)

SubControl

Inquiry	VISCA Code Inquiry	ECCP Code W1	VISCA Code Reply	ECCP Code W3	Description
CAM_ControllerInq	8X 09 04 17 FF	00100000 11000000	X0 4S FF X0 5S 02 FF	11000000 10000000 00000000	ON
			X0 4S FF X0 5S 00 FF	11000000 00000000 00000000	OFF

x=1~7 : address (Inquiry), x=9~f : address +8(Reply)

Configure

Inquiry	VISCA Code Inquiry	ECCP Code W1	VISCA Code Reply	ECCP Code W3	Description
CAM_DevTypeInq	8X 09 04 22 FF	00100000 00100000	X0 4S FF X0 5S 0Y0Y 0Z0Z FF	00100000 ZZ YY	YYZZ=ID

x=1~7 : address (Inquiry), x=9~f : address +8(Reply)

Mode

Inquiry	VISCA Code Inquiry	ECCP Code W1	VISCA Code Reply	ECCP Code W3	Description
CAM_WBInq	8X 09 04 35 FF	-	X0 50 00 FF	-	Auto
			X0 50 01 FF	-	Indoor
			X0 50 02 FF	-	Outdoor
			X0 50 03 FF	-	One Push
CAM_AF ModeInq	8X 09 04 38 FF	-	X0 50 02 FF	-	ON
			X0 50 03 FF	-	OFF
CAM_AE ModeInq	8X 09 04 39 FF	00100000 00000000	X0 4S FF X0 5S 00 FF	00000000 00100000 00000000	Full Auto
			X0 4S FF X0 5S 03 FF	00000000 00000000 00000000	Manual
			X0 4S FF X0 5S 0A FF	00000000 01000000 00000000	Shutter
			X0 4S FF X0 5S 0B FF	00000000 11000000 00000000	IRIS
			X0 4S FF X0 5S 0C FF	00000000 10100000 00000000	Gain
			X0 4S FF X0 5S 0D FF	00000000 10000000 0000000	Bright
CAM_EC ModeInq	8X 09 04 3E FF	-	X0 50 02 FF	-	ON
			X0 50 03 FF	-	OFF
CAM_MemoryInq	8X 09 04 3F FF	00100000 10000000	X0 4S FF X0 5S 0Z FF	10000000 0Z 00000000	0Z=Recall No.

x=1~7 : address (Inquiry), x=9~f : address +8 (Reply)

Position

Inquiry	VISCA Code Inquiry	ECCP Code W1	VISCA Code Reply	ECCP Code W3	Description
CAM_ZoomPosInq	8X 09 04 47 FF	01000000 00000000	X0 4S FF X0 5S 0Y0Y 0Z0Z FF	00000000 ZZ YY	
CAM_FocusPosInq	8X 09 04 48 FF	01000000 10000000	X0 4S FF X0 5S 0Y0Y 0Z0Z FF	10000000 ZZ YY	
CAM_ShutterPosInq	8X 09 04 4A FF	01000000 01000000	X0 4S FF X0 5S 0Y0Y 0Z0Z FF	01000000 ZZ YY	
CAM_IRISPosInq	8X 09 04 4B FF	01000000 11000000	X0 4S FF X0 5S 0Y0Y 0Z0Z FF	11000000 ZZ YY	
CAM_GainPosInq	8X 09 04 4C FF	01000000 00100000	X0 4S FF X0 5S 0Y0Y 0Z0Z FF	00100000 ZZ YY	
CAM_ECPosInq	8X 09 04 4E FF	01000000 10100000	X0 4S FF X0 5S 0Y0Y 0Z0Z FF	10100000 ZZ YY	

x=1~7 : address (Inquiry), x=9~f : address +8 (Reply)

8-7. VISCA Communications Examples

Network initialization (The receiving data is for when 3 VISCA devices are connected.)

Sending	Receiving	Function
88 01 00 01 FF		Clear message (broadcast)
	88 01 00 01 FF	Reply to Clear message
88 30 01 FF		Address message (broadcast)
	88 30 04 FF	Reply to Address message (broadcast)

The 3rd byte of the reply to an address message is the number of connected devices plus 1. In this example, three devices are connected, so this byte is 04.

Setting the focus position of the first EVI-310/IF-51 Board to 0105H.

Sending	Receiving	Function
81 01 04 48 00 01 00 05 FF		Focus Direct command
	90 41 FF	ACK of Focus Direct command
	90 51 FF	Focus Direct command completed

Setting the focus position of the first EVI-310/IF-51 Board to 0105H.

Sending	Receiving	Function
81 01 04 07 02 FF		Zoom Tele command
	90 41 FF	ACK of Zoom Tele command
	90 51 FF	Zoom Tele command completed (zoom tele starts)
81 01 04 07 00 FF		Zoom Stop command
	90 41 FF	ACK of Zoom Stop command
	90 51 FF	Zoom Stop command completed (zoom tele stops)

CAM_Zoom Tele/Wide and CAM_Focus Far/Near work until Camera_Zoom Stop , Camera_Focus Stop or other command is sent. CAM_Zoom Tele/Wide and CAM_Focus Far/Near can not be sent simultaniousely.

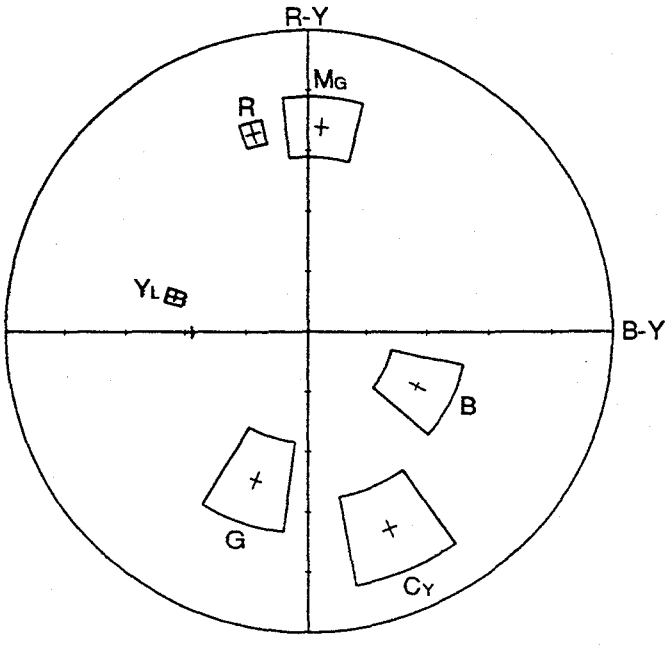
Inquiry about whether AF is ON or OFF, the position of zoom and the position of focus.
(In case it is inquired continually)

Sending	Receiving	Function
81 01 04 47 FF		ZoomInq command
	90 41 FF	ACK of ZoomInq command (socket 1)
81 01 04 38 FF		AFModeInq command
	90 50 02 FF	Auto Focus Mode
81 01 04 48 FF		FocusInq command
	90 42 FF	ACK of FocusInq command (socket 2)
	90 51 00 02 01 0E FF	Zoom position 021EH (socket 1)
	90 52 00 01 00 05 FF	Focus position 0105H (socket 2)

In case of Iquiry command, it might take around 0.5 second to receive the reply after the command is sent.
In case of sending the second command before receiving the first reply, ACK socket number and the completion message socket number should be checked.

FOR CAMERA COLOR REPRODUCTION ADJUSTMENT (1)

EVI-330V (NTSC)



Take a copy CAMERA COLOR REPRODUCTION FRAME with a clear sheet for use.

FOR CAMERA COLOR REPRODUCTION ADJUSTMENT (2)

EVI-331V (PAL)